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The OIL WEEKLY and The COMPOSITE CATALOG
for the drilling-producing-pipeline industry

PETROLEUM REFINER and The REFINERY CATALOG
for the refining-natural gasoline industry

THE OIL WEEKLY

ENGINEERING • NEWS • STATISTICS

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Contents • November 15, 1943

Volume 111, No. 11

The Changing Panorama..... 7

Technical and Feature Section:

Oil's Important Position of Helping to Win War Stressed by Petroleum Institute Speakers..... 8

Super Fuels Will Increase Post-War Car Mileage.....11
By R. L. DUDLEY

More Wells Necessary in 1944, Equipment Suppliers Told.....12

Manpower for Oil Production.....17
By JOHN M. LOVEJOY

Wartime Instruction and Training of Employes.....23
By L. S. WESCOAT

Practical Operating Hints for the Pipeliner.....26

Practical Operating Hints for the Production Man.....30

News and Departments:

Looking Ahead with the Editor..... 5
Washington Roundup 41
Markets, Statistics and Prices.....43
United States Field Operations.....47
United States Well Completions.....53
United States Wildcat Starts.....59
Squeaks from the Bull Wheel.....60
Notes for the Equipment Buyer and User.....62
Men in the Industry's News.....64
Index to Advertisers.....64

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LOOKING AHEAD
. . . with the Editor

AS A means of helping sustain daily average production of crude oil in the United States, secondary recovery is constantly getting more attention. It is obvious that we are bound to turn to more intensive exploitation of known pools, as reserves continue their decline and exploration nets fewer new fields.

One of the major standing committees of API is charged with compiling latest developments in secondary recovery practices, and is putting special emphasis on improved methods in this field of engineering. Next week and in subsequent issues the operation of secondary recovery projects will be dealt with in detail in papers by members of the API committee, bringing to readers of THE OIL WEEKLY the results of vast research along with information on most recent technical advancement in this important phase of the industry.

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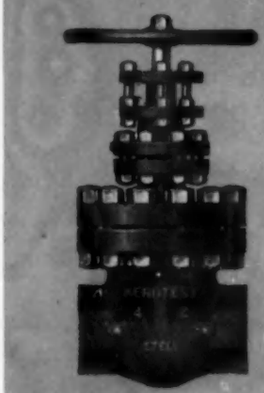

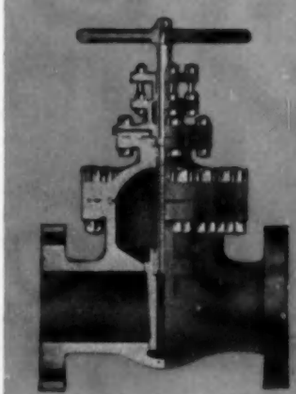

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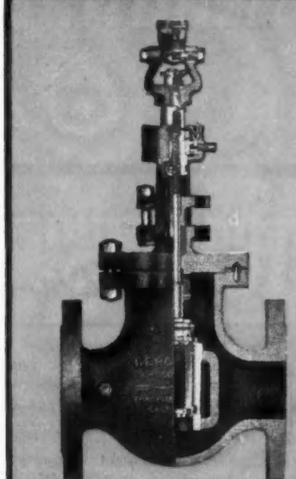

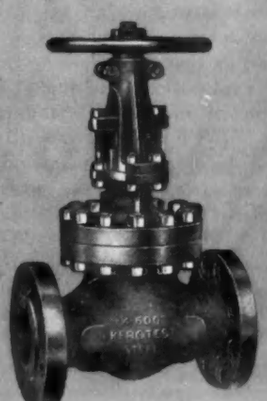

The Changing Panorama

Drilling Programs Must Be Planned

PRODUCTION operators gradually are developing into a single class, rather than the two present classes of operators who drilled more or less than 40,000 feet of hole during 1942, and as a result it is becoming increasingly necessary that all operators plan their drilling activities as far into the future as practicable, to meet PAW requirements.

On this basis, operators should file their WPB-2565 applications for those controlled materials which they believe they will require, as far as possible in advance of the time the materials are required by them.

The new P-98-b requires the filing of certain applications 90 days in advance of the quarter in which the materials will be needed, and PAW officials emphasize the increasing importance of all operators possible so filing.

It is warned, however, that operators should not file applications for more controlled materials than they believe they will actually use. If additional materials are required supplemental applications may be filed, and where operators find they have obtained an allotment larger than they require, they should promptly return the unneeded allotment to PAW, and as soon as delivery orders for controlled materials are canceled PAW should be notified so that the material freed may be made available to other operators.

Officials emphasize that all paper allotments of controlled materials be converted into steel, pointing out that every ton of steel which dies in the form of paper in an operator's hands is a ton of steel lost for use by the industry.

WPB Must Have Facts On Materials Priorities

PETROLEUM operators requesting materials on priorities are asked by PAW to supply all pertinent facts called for by the WPB, and outlined in the Critical Construction Materials Design Guide issued by War Production Board.

PAW points out that more efficient procedures in handling priority requests now make it possible for oil industry operators to receive approval twice as speedily as they could in January.

Even further reduction in processing time can be expected by the industry. A PAW representative has stated that the "Materials Division, in cooperation with PAW'S operating divisions and the War Production Board, has reduced the average time required to clear priority-rating applications by 50 percent since January, 1943. We are convinced that even further reduction in processing time can be made."

It was stated that delays in processing time of applications are usually caused by the operator's failure to supply pertinent facts as required by WPB. PAW has signified determination to do everything possible to cut the time required to grant approval on priority requests.

Production of High Octane to Keep Up With Military Tempo

AS A barometer of military activity, production of 100-octane gasoline for the rest of this year indicates continued intensification on all fronts—including the possible opening of new ones.

PAW announced recently that when the 1942-43 program is completed, 126 domestic refineries will be contributing to the production of 100-octane. Of these, 72 will make the completed product, while others will make components of the super-fuel.

Altogether, it was stated by PAW that $900,000,000 is being invested in production facilities for 100-octane. In addition to the complete plants which have been or are being built, more than 200 minor projects for changing or expanding existing facilities to increase 100-octane production, have been initiated. Oil companies are financing 85 percent of the program, and the Defense Plant Corporation is handling the rest.

Both large and small refineries are participating in the program. Under the guidance of PAW, patents and engineering knowledge have been pooled in many cases. Also engineering staffs of large companies which had developed processes for making 100-octane have been loaned to companies which before the war had not made the product.

To speed completion of the plants and keep abreast of demands for the superfuels, the War Department is cooperating with PAW by releasing surplus critical materials and equipment made available by the cancellation of Army Ordnance projects.

Scrap Inventories Fall Dangerously Low

"INVENTORIES of iron and steel scrap are falling to dangerously low levels," said E. W. Greb, Deputy Chief, Industrial Salvage Branch, WPB, in a recent talk before the country's leading oil men at the Petroleum Industry War Council meeting, Palmer House, Chicago. "At last report inventories were down to a 37-day supply. Certain contingencies must be guarded against if peak steel production is to be assured over the winter months.

"The 31-day late opening of the navigation season in the Great Lakes last spring cost the country 8,650,000 tons of iron ore." Mr. Greb reminded the oil men that the steel mills receive 95 percent of their ore from the Great Lakes area. Another adverse factor has been the interruptions to coal mining. "The coal strike of last spring resulted in a severe series of coal and ingot steel. Another series of coal mining interruptions has already cost tens of thousands of tons of pig iron production." These and other adverse factors are causing concern to WPB.

There has been a diminishing flow of iron and steel scrap to dealers and suppliers. Their inventories are low—far below a safe working margin in time of war. Should the steel mills require above-normal amounts of scrap to make up for lack of iron ore and pig iron, inventories in dealers' hands would be quickly wiped out. WPB and other interested agencies are concerned about this situation and are making plans to meet heavy demands for iron and steel scrap.

"The importance of the problem," Greb explained, "can be realized when we remember that half of every tank, gun, ship and submarine, is made of scrap steel. This takes on added significance," he added, "when this year's production schedules are compared with those of 1942." Explaining that much of the detailed information about production must remain secret, Greb said that production this year in war materials was about double the 1942 figure.

In urging the oil industry to intensify their salvage efforts, Greb paid tribute to their splendid work over the past months. He said he knew of thousands of carloads of iron and steel scrap that came from the industry last year at a critical period, when furnaces were shut down due to lack of scrap.

Oil's Important Position Stressed by Petroleum

PAW Executives Express Disappointment at Vinson's Refusal to Permit Crude Oil Hike; Wartime Problems Discussed at Chicago

OIL's place in a world at war, plans for the peace to come, and its relationship with government and the people were the themes of the Twenty Fourth Annual Meeting of The American Petroleum Institute at Chicago last week.

Free enterprise was stressed as being essential to the successful operation of the petroleum industry, and from Petroleum Administrator Harold L. Ickes and Assistant Petroleum Administrator Ralph K. Davies came the reiterated assurance that governmental regimentation of oil would cease immediately upon cessation of the war.

The obligation of informing the American people of what the petroleum industry is doing and what it means to them in time of peace as well as war was classified as another essential activity. Especially if the industry's position was to be understood and appreciated. This, it was said, would pay dividends.

Because of the vast quantities of oil needed in modern warfare and its vital duties, petroleum was classified as a top ranking factor in the winning of the war.

The next annual meeting of the institute will be held in Chicago on dates to be announced later.

Free Enterprise

On the subject of free enterprise, William R. Boyd, institute president, gave this estimate of what the petroleum industry faces:

"Fortunately for the petroleum industry we feel that we have little to fear from direct government domination as long as Secretary Ickes retains his post as petroleum administrator and to whatever extent he may control government policy. For we have his repeated assurance that so far as he is concerned, 'come peacetime' he wants promptly to disband PAW and again leave the petroleum industry to its normal peacetime responsibilities and competitive operations."

From Administrator Ickes whose paper was read by George A. Hill, Jr., because Ickes could not attend, came this statement: "When I addressed your convention in San Francisco back in 1941, there were those of you who feared that I wanted to take over the oil industry . . . I hope that I have disabused you of the delusion, but if there still be any who doubt, let me repeat that I still feel as I did in San Francisco. When the emergency has ended, if I have any authority in the matter, you will find me on your side working to restore the oil industry, so far as may be possible, to its ante-bellum competitive status just as speedily as it can be accomplished. We will get rid of the orders and directives."

Davies also gave assurance that PAW would cease functioning at the close of the war, who declaring that PAW exists for no other reason than a necessary wartime task. "I speak the mind of Secretary Ickes as Petroleum Administrator, as well as my own, when I add that the liquidation of this war agency finally is a thing devoutly desired. The day cannot too soon arrive that we revoke the last of our war orders."

Government Relationship

The harmony between government and the oil industry in its war cooperation and some of the benefits resulting from this satisfactory relationship were stressed.

One benefit of the relationship between the industry and government was given by Davies as follows:

"And the new era post-war, will be ushered in with a leadership better qualified to cope with the complexities of the modern world; better because this war experience to which it has been exposed—perhaps somewhat painfully, but the pains are, at least in part, pains of growth. The American oil industry has developed a technical 'know how' that is matchless, and today it is developing a comparably superior managerial skill in the handling of its public and its governmental relations—a new kind of 'know how'—a quality of statesmanship—oil statesmanship. Here is an important gain."

The harmony between the industry and the government was described by Boyd to have continued to "flourish in a manner most satisfactory to both partners and to the best interest of the nation. This relationship between government and business is at once the envy and despair both of other industries, who look for partners like Petroleum Administrator Ickes and Deputy Administrator Davies and their staff, and of other government agencies that crave a united industry represented by the counterpart of the Petroleum Industry War Council and the PAW district organizations."

Price Situation

The recent refusal of Economic Stabilization Director Vinson to raise crude oil and petroleum product prices was classified by Boyd, Davies and Ickes as being very disappointing, and drew this comment from Ickes:

"His verdict was no less disappointing to us than it was to you, but it is nevertheless, the verdict. Whatever may be the final means of stimulating the discovery, development and production of additional crude oil reserves, Judge Vinson has now advised the Petroleum Administration and the industry, through the Petroleum Industry

# of Helping to Win War

Institute Speakers

War Council, to attempt to devise some plan, short of a general price increase, which will provide additional financial incentives for the achievement of these ends.

"Obviously an attempt to invent some such plan or program is the next step." After mentioning that Judge Vinson had asserted the belief that it would be possible to devise a practical, workable program, Ickes declared:

"However, thus far we have been unable to formulate such a plan. But, in view of Judge Vinson's request that we discover some new formula short of a general price increase, I have asked my staff, and I now urge the industry, to undertake immediately to try to formulate some program or policy, other than a general price increase—one which we can conscientiously recommend to Judge Vinson as practical, workable and administratively feasible.

"Above all, I am unwilling, in view of our need of additional reserves, to allow this question of proper financial incentives for producers to remain unsolved. Therefore, it is necessary that we proceed in good faith and with all possible speed. This, as I have said, is the next step. Only after we have attempted to devise such a program as has been requested can we in PAW determine what the steps thereafter shall be."

Public Relations

"Next to our own primary job of winning the war, I submit that the most important duty of the petroleum industry," declared Boyd, "is frankly to tell the public our problems and I commend that duty to you as an important part of your individual and collective efforts for 1944."

The obligation of informing the American people of what the petroleum industry is doing and of its problems was further stressed by Boyd in these words:

"We must tell the public that for the petroleum industry this is an all-out war. We must tell them that as far as oil production is concerned we are going all-out; that we have called up the reserves we were hoping to hold for them until tomorrow, and that the decimation of those reserves this year means a weakened and exhausted line tomorrow unless a great new reservoir or reserves is found."

Future Prophesy

As for the future, Davies stressed 10 points in this fashion:

"Prophesying the future in time of war is a dangerous business and there is no point in taking unnecessary risks, but if I were to do any crystal ball gazing, I am sure I should detect these signs almost unmistakably:

"1. We face a definite shortage of crude oil in this country in the coming year, unless the unforeseen happens in new discovery or the estimates of military requirements do not prove out.

"2. The manpower situation in general will become progressively worse as men heretofore deferred for dependency are called.

"3. The materials position will improve somewhat with sufficient materials for essential operations, some relaxing as in the matter of well spacing, but with no prospect of unrestricted activity.

"4. The oil transportation problem—at least domestically — is pretty well solved.

"5. Refining capacities will be taxed to their efficient limits in 1944 if forecasts of military demands materialize.

"6. Refining operations will have to be conducted under the additional handicap of the unavailability of the desired qualities of crudes.

"7. The quality of finished products will have to be debased, though they should remain sufficiently high to meet all practical necessities.

"8. The gasoline supply for the motorists in 1944, on the basis of present military estimates of demand, cannot be greater and may well be less.

"9. The full war order for oil, plus the industrial and curtailed civilian demand, can only be met this coming year through greater reliance upon foreign oil resources, both British and American.

"10. The present rate of new tanker construction and the improved control of the submarine menace, assures an improved transportation capacity and greater flexibility, making possible a better balanced world-wide program of oil supply.

"The fact that our nation," Davies continued, "has possibly, if not probably, passed the peak of its productive capacity, faces us with two urgent and pressing problems: One, of discovering additional reserves; The other, of producing the greatest amount of oil and gas from them. Each of these problems is difficult to solve."

Foreign Oil

Naturally the fact that the United States faces a shortage of oil, made the speakers think of the program to use more foreign produced crude, especially in view of the heated controversy that it has stimulated. On this subject, Ickes made his position clear in these words:

"The fact remains that the demand for oil for war is increasing. The fact remains that the only place in the United States where crude oil production can be increased substantially from known reserves is in West Texas.

"And, there is more to the situation even than the necessity of supplying the requirements of war. There is the consideration of what our position is to be after the war. I want to see the American petroleum industry live and prosper for many years to come. I dont want to see it wear itself out and slash years from its life by a wartime burst of inefficiently excessive production that would injure our oil fields irreparably. It is for this reason that we have long planned our activities so that, as conditions make it possible, the oil fields of other lands would contribute their share to the United Nation's needs. It is for this reason, and not for the purpose of slipping in—under the guise of wartime necessity—a wedge that would

threaten our domestic producers when peace comes."

Assures Independents

Ickes declared that he could well understand the particular interest of independent producers in the subject of foreign oil, and that it was natural for them to fear competition from low-priced foreign crude and therefore oppose any large-scale importation of oil that might displace domestic production. On this subject, and in connection with the charge "that someone has been burping that PAW is dominated by the majors or that PAW lacks sympathy for the independents," Ickes declared if anything "were needed to make this kind of thing more stupid than it is naturally, it is the fact that, all of my life, I have been motivated by the fervent desire to protect the rights of the independent businessman. Indeed, I have been so active and out-spoken in this regard that I have on occasion been accused of being 'anti-big business.' Well, it so happens that I am not a foe of big business, so long as it is honest and so long as it is not monopolistic. However, I never expected to live to see the day when I would be branded as 'anti-little business'."

Ickes said it was true PAW had major oil company men on its staff. But "far from attempting to use their positions to trample upon the independents, they have—judging from the evidence that I have seen—been scrupulous in leaning in just the opposite direction." He pointed out that it was his aim to strike a balance between independents and majors on the industry committees, and he told small operators to use the voice they have in these committees if they had any just grievances.

Petroleum Reserves Corporation

While on the subject of foreign oil, Ickes turned to the Petroleum Reserves Corporation, about which "there seems to have been a great deal of misguided and inaccurate speculation as to its purposes and future course of conduct." He said that in order to protect business here in the United States, to assure the American people of enough oil to meet their needs, and to make certain that there is sufficient oil for military requirements, it was necessary that "the United States obtain a fair measure of access to foreign oil resources."

The United States, he continued, is one of the few "major countries which has not participated in foreign oil activities through governmental financing or direction. To the extent that private capital and private initiative are unable to establish and maintain a national position in this field, government assistance and participation may be necessary. The Petroleum Reserve Corporation is available for these purposes whenever and wherever necessary."

Ickes also took up the matter of Directive No. 70, as another phase of foreign oil that has been the target of "some indiscriminate shooting." This directive, he said, was issued to make possible the same kind of joint use of facilities and products in foreign operations as were being employed at home. He declared that it most assertedly was not a cartel. "It calls for a pooling of products and facilities. At the direction of PAW, for the duration of the war. It has nothing to do with prices, it does not limit spheres of operation, and since it is a governmental design in order to facilitate the distribution of supplies to the armed forces, not only with the knowledge and consent of the government but at its direction, it cannot by the widest stretch of the imagination, be called a cartel."

Importance and Accomplishments

The importance of oil and the accomplishments of the industry during wartime were stressed by Ickes, Davies, Boyd and other speakers. They referred especially to the miracle in building a new transportation system and to the construction of aviation gasoline plants that have increased the output of this war fuel to such great quantities.

"When President Roosevelt stated that the October 8 blasting of Bremen and Vegesack with 1250 tons of bombs required nearly a million gallons of 100-octane gasoline and 25,000 gallons of aviation lubricants," Boyd said, "he indicated that it takes nearly three pounds of gasoline to deliver one pound of bombs to the objective."

From Warren H. Atherton, National Commander of the American Legion, came this paragraph: "The Allies' greatest stroke of genius was to spot the Axis Achilles heel and to enlist mother nature on our side. One hundred octane, oil that lubricates at 60 below or 120 above, T. N. T., and myriad petroleum products are beating Hitler to his knees."

After pointing out the tremendously important role that petroleum is playing in the war, Assistant Secretary of the Navy Ralph A. Bard explained what the military did with the oil it received. "Aviation gasoline," he said, "is the largest military use of petroleum today, a fact which speaks volumes about America's use of air power." Second largest military use of petroleum products is motor fuel, most of which goes to the Army ground forces for use in tanks, jeeps, trucks, and other motor-driven vehicles. The third great military use of petroleum is fuel oil, used by the Navy to drive all modern seagoing boats. These three uses of petroleum, he stated, are roughly equal in size.

A fourth military use of petroleum products, which is less than half as large as each of the other three, is diesel oil, which is divided almost equally between the army and navy for diesel-power vehicles such as tanks, submarines and small landing craft. The last and smallest military use of petroleum, according to Bard, is lubricants, which is consumed at a rate about one-sixth the volume of fuel oil and about half the volume of diesel oil. In a "raid like that on Wake Island our planes will use a gallon of oil for 100 gallons of gasoline.

"These are only the strictly military requirements for petroleum products stated in terms of volume" he continued. If petroleum consumption is stated in terms of dollars and if the figures are enlarged to include lend-lease and War Shipping Administration operations, as well as those of the Army and Navy, the division of each dollar spent for petroleum products would be something like this: 44.7 cents of each dollar would go for aviation gasoline, 18.1 cents out of each dollar would be spent for motor gasoline. 18.4 cents would be spent for fuel oils of all types, 5.9 cents would go for diesel oil and kerosene, and the last 12.8 cents would be spent for lubricants including aviation lubricants.

Victory in this war depends on plenty of oil, and we must have still more of it, Charles E. Wilson, executive vice chairman of the War Production Board, declared. Every day of the bitter fights now raging teaches us anew that "oil saves lives," said Wilson, and asserted that oil will be called upon for an ever greater effort for the final lap in the race to victory.

In every day of battle he continued, "our fighting men, whether on land, on sea, or in the air, depend on the mobility and speed and the maneuverability" of their equipment. "That mobility, that speed, that maneuverability, are made possible by oil . . . Without oil, all the rest of our enormous war production program could not succeed.

Wilson said that special WPB priorities had been granted for a stepped-up aviation gasoline production program. It is now time to do for other petroleum consuming weapons and munitions of war what has been done for aviation gasoline. For instance, Wilson stated, the 1944 military truck program will require more than twice as many heavy trucks than manufactured in 1943, and manufacture of other mobile equipment will be similarly accelerated. This, of course, will require much more motor fuel gasoline.

Super Fuels Will Increase Post-War Car Mileage

By RAY L. DUDLEY
Publisher, The Oil Weekly and Petroleum Refiner

THE automotive industry has no new motor or complete car on its drawing boards, ready for production at the end of the war, which will develop such efficiencies as to have a bearing on the consumption of petroleum, Alfred P. Sloane, chairman of the Board of General Motors Corporation, told the writer in New York last week.

As a matter of fact the automotive industry has been so busy in war work that there is no question as to what kind of automobile will be produced during the year or so after peace with Germany, Sloane said, reiterating statements of this nature he has made before. The 1942 model will be the model which will be made for some time after the close of the war.

Three Years Before New Cars

But within three years after the war with Germany it is probable that, through redesigning to take full advantage of 100-octane motor fuel, a car will be in production which will develop on the average 20 percent more mileage per gallon of fuel consumed, as compared with present day cars.

Normally it would require seven or eight years for existing automobiles to be converted to the new contemplated efficiencies, he said, but added that the virtual cessation of sales during wartime may affect the length of time necessary to convert the country to the new models. He said that it was his opinion that the public might want 50 percent more cars during immediate post-war days than the automobile industry could supply, and remarked that he believed that the public would have the money with which to buy them.

Auto Engineers at War

He emphasized that automobile manufacturers have gone to war not only with their full manufacturing facilities, but with their engineering staffs as well, and said that other than some thinking, and some sketching (the expression is ours) in the way of "facelifting" the 1942 models, no work whatever has been done.

"And as things now stand we still cannot do any post-war work in the way of engineering, because of the manpower situation," he declared.

Such thinking as has been done (and we suspect that it would be a pretty hard thing for automotive engineers to get out of the habit of projecting their thoughts into the future), has been along the lines of utilizing the higher-octane fuels which will be available after the war.

Long Slow Job

"After an engine is developed into a satisfactory design, it takes at least a year to get it into production," he said. "For instance, if we had an engine in this room right now, perfectly validated, it would take a year to start producing it.

"If you redesigned the present engine to use 100-octane fuel it involves the entire design—better bearings, for instance, a move from side valve to overhead valves to get higher compression. Such redesigning will take considerable time and further time would be consumed in testing the development properly. Involved, too, would be the entire chassis design."

Sloane said that just to re-tool General Motors plant would require the expenditure of $75,000,000, not including such machinery as may be needed.

"And on this *post-war car* (not to be confused with the automobile we shall be selling immediately after the war) we have done practically no engineering," he added.

The car of new design which may be expected to come in post-war days and which is here termed the *post-war car*—will secure its increased efficiency through:

1. Improved design of the motor to use higher-octane fuels, ranging up to and possibly above 100-octane;

2. Lighter weight of the car. This lighter car weight will be achieved through the more extensive use of the lighter metals already in use. Sloane thinks that the weight of the car of the future can be reduced by 15 percent.

Automatic transmission, on which considerable development has taken place for the government in connection with tanks, will eventually be a "must" on all cars, Sloane says, but thinks that it will be some time before automatic transmission will be put on the lower price cars. It is possible, he thinks, that automatic transmission may mean a reduction in fuel consumption of 3 to 5 percent.

Evolution—Not Revolution

The statement of Sloane that such improvements as may be expected in increasing the mileage efficiency of automobiles yet have to be designed, and that it is not contemplated at this time that they will be a great deal more than evolutionary, as opposed to revolutionary, is of the deepest interest to the oil industry and to the public in view of the prospects for decreased domestic crude oil production. There had been reports that engines were "on the boards" which would mean a 100 percent increase in mileage per gallon of fuel consumed. Obviously, such reports are not borne out by the facts. A twenty-percent increase in efficiency, which involves only cars using the higher-octane fuels, practically means that it will be a long, long time before the domestic demand for lower-octane, or ordinary pre-war-octane motor fuels, will be drastically reduced. His statement is particularly interesting to companies owning the new high-octane gasoline plants, because it indicates not only a market for such products but a trend which probably will affect all refining. In other words, the trend definitely continues toward higher-compression motors in automobiles, and towards higher-octane motor fuels.

DYNAFUEL, a super aviation fuel concentrate has been announced by J. Howard Pew, president of Sun Oil Company. The new fuel is made entirely from petroleum and is specially processed, according to the announcement.

It was stated that this super fuel concentrate is 50 percent more powerful than United States standard 100-octane test gasoline. Dynafuel is never used undiluted, but is blended with gasoline produced by other methods in order to step up their quality as aviation fuel. Thus the new development makes possible the production of greater quantities of aviation fuel made to highest military specifications.

More Wells Necessary in 1944, Equipment Suppliers Told

ACCELERATED petroleum operations, both in domestic and foreign fields, require that materials be supplied in increasing quantities, and this is going to be dificult as long as military and other essential needs exceed available supplies, the Petroleum Equipment Suppliers Association was informed at its annual meeting in Chicago last week.

What is expected in the way of drilling and what must be done by manufacturers, oil companies and PAW to drill the 24,000 domestic wells considered necessary to provide a record-breaking amount of crude oil during 1944 were discussed by Donald R. Knowlton, director of production, and Frank A. Watts, director of materials for PAW.

Increased Drilling

Knowlton referred to the various obstacles which have confronted the oil industry and the manufacturers in getting materials and mentioned the recent refusal of Price Czar Vinson to grant a crude oil price increase as one of the things which will make the fulfillment of PAW's program more difficult. He said, however, that he believed the necessary 24,000 United States wells would be drilled in spite of the failure to advance crude prices, although it would be done with difficulty and at a great sacrifice.

"An expanded oil and gas well drilling program of 24,000 wells—5000 exploratory and 19,000 development wells —will be necessary in 1944," Knowlton declared.

"The 25 percent increase over the 19,000 wells that probably will be completed this year is planned to provide all the increase in oil production that is possible from present domestic oil fields and from the new fields that are expected to be found on the basis of past experience. This compares with a drilling rate in pre-war years of around 30,000 wells a year.

"The 1944 drilling program will meet, insofar as possible from oil fields in this country, under present economic conditions, the rapidly increasing demand for petroleum for mounting war needs. The demand for domestic crude oil already has increased from an average of 3,795,000 barrels a day in 1942 to 4,114,000 barrels daily in 1943. The present program, which represents the best information available of both supply and demand, anticipates a demand for 4,334,000 barrels a day in 1944." (Later, in response to a question, he said that imports would likely run in excess of 300,000 barrels per day, from the Caribbean area.)

"These figures include the demand for domestic oil only, and count on the maximum practicable use of available foreign oil to supplement our own production to meet domestic refinery requirements. To meet this demand, the present production rate, already at an all-time peak, must be increased still further, and this increased rate must be maintained throughout 1944," he asserted. "To accomplish this, in the face of the decline in productive capacity of existing fields and wells, which is hastened by prevailing high production rates, the number of wells drilled next year must be increased to at least 24,000.

"This drilling program, as estimated by the Petroleum Administration, includes 19,000 development wells to be drilled in known oil, gas, and condensate fields, and 5000 exploratory wells. Exploratory drilling in 1943, which is expected to total only about 3400 wells, in far short of the 4500 such wells which the Petroleum Administration believed to be necessary this year. To prevent an even more serious reduction in the reserves and productive capacity of the nation, it is imperative that exploration drilling be stepped up to at least 5000 wells next year.

Facilities To Be Available

"The Petroleum Administration fully expects that manpower, materials, and facilities can and will be made available to enable the industry to drill at least 24,000 wells during 1944. The accomplishment of the increased program, however, will require foresight and planning on the part of production operators and equipment manufacturers as well as by the Petroleum Administration.

"Production operators must plan their activities as far in advance as possible so that their purchases of equipment and their drilling operations can be scheduled in an orderly efficient manner. Manufacturers of petroleum industry equipment must plan adequate production schedules and keep their facilities on a sufficiently flexible basis so as to meet the increased demands for equipment that will result from the expanding drilling and production program.

"At the same time, the Petroleum Administration has every assurance that all necessary materials will be made available to both operators and manufacturers, but the supply of most materials in still critical and there is no possibility of removing restrictions entirely. The Petroleum Administration is taking every action within its power to aid in the attainment of this essential program, and stands ready to assist both operators and the equipment industry whenever necessary to meet the 1944 drilling program.

Manufacturer's Responsibility

"A great responsibility rests on the manufacturers and suppliers of oil field equipment in making possible the accomplishment of the oil industry's development program of 24,000 wells for 1944," Knowlton emphasized. "The material and equipment required for these operations must be made available since they will be needed in order that our oil commitments for military and civilian use can be met.

"You are to be complimented on the speed with which you adjusted your

operations during the past two years of the industry's reduced drilling program and concurrently gave such valuable assistance in supplying equipment needed in other phases of the war program. Now that we have exhausted the large inventories of material with which we entered the war era and will soon be utilizing fully the oil productive capacity of the nation, it is doubly important that your products be available to meet the demand of a greatly stepped-up oil field development program."

At one section of the question and answer portion of the meeting, Knowlton said that 1942 operations were carried on out of stocks held by the oil companies, to the extent that only about 10 percent of the steel required came from the mills that year. He said that the saving in steel through the foresightedness of the oil companies was, in itself, enough for 50,000 General Sherman tanks!

"I urge that each of you immediately made plans to adjust your operations to keep pace with the increasing demand for your products, both from the standpoint of new equipment and repairs for equipment now in operations," he said. "I hope that through your own efforts and ingenuity you will be able to find the space and facilities in your plants for increased production of oil field equipment.

Urges Conversion

"The Petroleum Administration for War has no desire to interfere with your contractual relations with other industries or agencies. However, we are charged with the responsibility of producing enough oil to meet the military demand and the most essential of civilian requirements. You and your employes engaged in the production of petroleum equipment are as much in the service of our country as are those engaged in the manufacture of munitions or planes or guns. Without the equipment you make to produce, refine, and transport oil, none of the machines of war could function, so it is necessary that you each take your place in line in the battle of production.

"We in PAW recognize that there may be instances where a combination of circumstances may prevent your achieving the desired results and in this connection we stand ready to assist you. The machinery has been set up during the past week which will enable us to aid a manufacturer should he, after he has exhausted other possibilities of relief, ask us to intercede in his behalf. It is hoped, however, that you will be able to work out your own problems and to gear your production so as to keep supply and demand in balance and in pace with the planned increased drilling program."

Knowlton said that there is no certainty that the Caribbean area will be able to furnish enough supplementary oil, because difficulty may be encountered in getting enough of the kind of oil needed. (Heavy oil does not play an important part in the necessary supply picture, and much of the Venezuelan crude supply is heavy gravity oil.) Approximately 800 wells are scheduled to be drilled in the Caribbean and Near East areas, of which more than 700 will be in the Caribbean area.

More Equipment Needed

Frank Watts, materials director for PAW, dealt chiefly with the mechanics of the problem and with the need for manufacturers to get back on oil field equipment production as rapidly as possible.

"The military has recently agreed to cooperate with PAW and you, in diverting some war contracts, or withholding some, from some plants ordinarily devoted to the manufacture of oil field equipment, in order that these plants may increase their oil field equipment output," Watts said. (This is in line with letters some manufacturers have been receiving recently.) Watts urged that the manufacturers do this reconversion to oil field equipment in order to fill orders for the equipment badly needed in the coming drilling campaign. He said that the military realizes it is just as important to make the equipment necessary to get the oil as it is to make the equipment on the battlefront using the oil.

Expressing his belief that the 1943 controlled materials plan is basically sound and is functioning to the benefit of the war effort, he gave some figures on carbon and alloy steel requirements of the industry for the coming year.

PAW's first quarter allotments will probably not be known until November 12 or later. It is presently estimated that about 430,000 tons of carbon steel and 88,000 tons of alloy steel will be alloted PAW for first quarter 1944 petroleum operations. Such a carbon steel allotment would be less than third and fourth quarter 1943 allotments, because comparatively small amounts of material will be required during the first quarter of the year for refinery construction program and because the "Big Inch" and "Little Inch" War Emergency Pipelines will require no material during the first quarter.

"Alloy steel requirements slightly exceed those of the third and fourth quarters of 1943, because the needs for N-80 casing and tubing and Grade E drill pipe have steadily increased," Watts said. There are several reasons for this condition. These include the new API list, which eliminated some of the heavier grades of J-55 and replaced these with N-80, and an increase in deeper drilling. "It now appears that there will not be sufficient pipe mill heat treating capacity to fill all first quarter orders for N-80 casing and tubing and Grade E drill pipe. It will therefore be necessary for petroleum operators to practice tailoring of casing strings in order to obtain maximum footage from given tonnages, using minimum amounts of N-80. It will be necessary that some of the Grade E and trade brand alloy drill pipe orders

PAW Program for 1944 Drilling

Here is how the "minimum of 24,000 wells for 1944 in the United States," referred to by Don Knowlton, Director of the Production Division of PAW, are now anticipated by districts and by quarters. It should be remembered that this is PAW's idea as to where and when wells will likely be drilled; that the figures are minimum; that there may be revisions, and that the PAW hopes that 5000 of them will be wildcat wells:

District	First	Second	Third	Fourth	Total
1	950	1100	1150	1100	4300
2	1900	2160	2330	2240	8630
3	1940	2125	2350	2130	8545
4	125	130	175	150	580
5	485	485	495	480	1945
Total	5400	6000	6500	6100	24,000

Ferd Spang Elected Head of Supply Men

Ferd J. Spang, Spang & Company, Butler, Pennsylvania, was elected president of the Petroleum Equipment Suppliers Association. He succeeds Fred F. Murray, Oil Well Supply Company, Dallas. Hugh H. Glen, Emsco Derrick & Equipment Company, Los Angeles, was elected vice president. Wharton Weems, Houston, was re-elected executive secretary and counsel.

Forty-eight directors were elected, 46 of them re-elected. The two new members are: Jack Pike, president of Republic Supply Company of California, Los Angeles; and Warner Parker, manager of sales for Oil Well Supply Company, Los Angeles.

be changed to Grade D. Production operators must cooperatively work with the PAW District Offices and the pipe mills to keep in balance the supply of and demand for alloy casing, tubing, and drill pipe.

Oil Allotments

"As indicated, PAW's first quarter allotments will not be known until November 12 or after. However, it is estimated that of PAW's first quarter allotments, 253,000 tons of carbon steel will be available for casing, tubing, drill pipe, and line pipe and that 52,000 tons of alloy steel will be available for casing, tubing and drill pipe. Of the 253,000 tons of carbon steel, 192,250 tons should become casing, tubing, and drill pipe and 60,750 tons should be made into line pipe and standard pipe. The 52,000 tons of alloy steel for oil country tubular goods would all become casing, tubing, and drill pipe. Of all controlled materials to be acquired for petroleum industry use during the first quarter of next year, about 70 percent will be some item of tubular goods.

Estimate Given

"It has been estimated," Watts continued, "that, as potential producers of oil, gas, and condensate, 5400 wildcat and development wells will be drilled during the first quarter of the year. During recent years 40.5 tons of casing, tubing, and drill pipe and 13.5 tons of line pipe have been delivered by the mills for the average wildcat and development well. By multiplying 40.5 tons by 5400 wells, a total of only 218,700 tons is obtained. By adding the 192,250-ton allotment of carbon steel for casing, tubing, and drill pipe to the 52,000-ton allotment of alloy steel, we arrive at a figure of 244,250 tons. This amount is 25,550 tons greater than 218,700 tons. These figures are given to indicate that a supply of oil country tubular goods is now being produced and will be produced at a rate equal to the petroleum industry's needs for these materials.

"Since the allotments to PAW for oil country tubular goods must be divided among an unknown number of production operators who drill an unknown number of wildcat and development wells—now estimated to be 5400—and since there is little difference between the amount of material allotted PAW for oil country tubular goods and the amount of material required by petroleum operators as oil country tubular goods, it is necessary that all production operators and PAW work closely together to keep in balance the supply of and demand for oil country tubular goods.

Operations Planned

"About 70 percent of all drilling operations are now being planned well into the future. Within practical limits, it is necessary that this advance planning continue. It is most necessary that all production operators whole-heartedly cooperate with PAW and the pipe mills to keep supply and demand for oil country tubular goods in balance. Advance first quarter applications from production operators for oil country tubular goods were for 347,500 tons of carbon steel and 74,000 tons of alloy steel. These amounts of material, if acquired in the form of oil country tubular goods, would be sufficient for the drilling and completion of 8400 wells. Obviously such a program could not possibly be attained. These figures are mentioned only to re-emphasize the need for your complete cooperation."

Watts said that the utmost cooperation must be had between the manufacturers, the producers and PAW in order to utilize the steel scheduled. He urged that the manufacturers point out any needs not covered, that "when the allotments received by you are not sufficient for you to carry on your part, come in and raise hell with us!"

Promises Help

He added that PAW expects manufacturers to initiate and carry on plans to get the necessary materials.

"We do not want to run your business," he asserted, "but we do want to work with you so as to help you do what is necessary."

He referred to an inquiry he desired circulated among the manufacturers, not reading it but laying it on the desk of Wharton Weems, executive secretary of the Petroleum Equipment Manufacturers and Suppliers Association. It is reproduced herewith:

Information a Manufacturer Should Include in a letter to the Petroleum Administration for War in case the Manufacturer Appeals for Assistance to Meet Petroleum Industry Requirements for an Indispensable and Vital Product.

List for the critical item or items of oil field equipment by unit, product group or dollar value:

1. Your normal yearly production.
2. Your present production.
3. What proportion of the Industry's requirements do you now produce.
4. Your production program for 1944.
5. Anticipated demands due to increased drilling program.
6. Maximum production if all facilities in your plant were available.
7. Specify commitments in your plant that interfere with production and to what extent production would increase if these commitments were modified or cancelled. Give detailed information.

Watts referred to the depletion of shelf stocks in the supply stores and said that steps are being taken to replenish these stocks which became critically low about two months ago. Tool joints were touched on and he said that at the present time the supply is inadequate, but that within six months he thought that this situation would be cured. He said he knew of no rigs shut down for lack of tool joints, but Arch Rowan, president of the American Association of Oilwell Drilling Contractors, in some remarks at the close of Watts' talk, said that he knew of some. Watts asked him to furnish his office with detailed information. The rock bit situation is bad right now also, he said, but indicated that this should be straightened up shortly.

Manufacturers have a backlog of about 6 months orders on tool joints, Watts said. Two manufacturers have recently taken steps to increase their capacities. Heavy allocations of alloy steels are being made to increase rock bit production.

He urged that if a manufacturer got a "piece of paper" with the rating too low, "complain—don't file it in a drawer but come to us and fight back.

"Whenever you run into a bottleneck or hit your head against what seems like a stone wall, ask us to help you."

Engine Parts

Watts admitted that the program on engines and repair parts was slow in getting started and may take some time to get into full swing, and that right now, as a result, the oil industry is in a period of patching up and using this makeshift and that one. He gave the impression that the engine problem would take longer in solving, for instance, than the tool joint problem. A survey is under way now on the matter of internal combustion engines for the oil industry, he said, which should provide some information valuable to the solution of this problem.

In response to a question, he said that allocation of oil field equipment is in the hands of three agencies, or rather, two. Domestic allocations are handled by PAW materials department; foreign by the foreign department of PAW, and Russian requirements by still another group. These three groups of men are in close coordination, he asserted. Russia, he said, has not been very actively in the market for oil field equipment during the past year, but will be active during the coming year.

Higher Crude Prices Urged by Petroleum War Council

AFTER being informed by its economics committee that the supplies of gasoline in this country would not be plentiful during the European phase of the war, the Petroleum Industry War Council, at its monthly meeting which was held in Chicago November 8-9, urged Congress to amend existing price control statutes to insure an increase in the price of oil so that the producing capacity of the United States might be enlarged.

The resolution to Congress on oil prices was passed along with another which urged the Petroleum Administrator for War "to renew his efforts to obtain a general increase in the price of crude oil." This last resolution further reiterated the attitude of the council that bonuses and subsidies will not adequately stimulate the drilling of oil wells.

These actions were taken following the report of a committee, headed by J. C. Hunter, president of the Mid-Continent Oil & Gas Association, which had been named to consider the suggestion of Ralph D. Davies, Deputy Petroleum Administrator, that the Council "give further thought to the question of an alternative to the recommended crude price increase," as recommended by Economic Stabilizer Vinson.

The resolution to the Congress declared "it is still the opinion of the Petroleum Industry War Council that the price of oil must be raised if the oil industry is to fulfill its obligation to produce sufficient oil to meet the need of the war program and essential civilian demand," and then asked the Congress of the United States "to take appropriate action to amend the existing price control statutes so as to insure a proper and adequate price for crude oil and its products."

The other resolution pointed out that the council had "carefully reviewed the decision of Vinson issued under date of October 29th," and that the industry and PAW had "long ago set in motion the various plans suggested by Vinson for the development, expansion, and increased availability of its productive capacity." The resolution then continued to say that the increasing military demands and the uncertainties of enemy action together with declining production capacity "foreshadow an increasing shortage of supply."

This resolution declared that Vinson's proposal for financial incentive ignored the long studied conclusions of the industry on the "impracticability of subsidies, bonuses and other incentives falling in this category," and that these suggestions had been reviewed again and that again the considered opinion had been reached that "there is no way in which the productive capacity of this nation can be increased without greater overall oilfield activity and that this can only be achieved effectively and efficiently through greater overall price incentive." It then asked that Ickes renew his efforts to obtain a general increase in the price of crude oil with corresponding increase in product prices.

Economic Report

It was the opinion of the Council's economic committee that it would be necessary for the industry to strive to meet military and essential civilian requirements by increased takings from foreign sources, holding domestic consumption to essential needs, drawing upon some domestic fields for production in excess of the maximum output consistent with good engineering.

The report was filed by Dr. Robert E. Wilson, president of Pan American Petroleum & Transport Company, Chairman, with Fred Van Covern as acting chairman of the working subcommittee.

The estimate as to gasoline was:

"The outlook for gasoline supplies has improved slightly but continues tight and will doubtless continue very tight throughout the European phase of the war in view of the fact that military and export demands now take about one third of the total output of gasoline in this country. Military demands are also taking the best part of the gasoline from the standpoint of octane number and volatility, which necessitates some reduction in quality of civilian gasoline in these respects. There does not appear to be any prospect of relaxation of rationing but equitable nationwide distribution of available supplies can and should be attained."

The estimate of the objectives of the Petroleum Administration for War were thus given:

"The present PAW program has been formulated on the basis of meeting military requirements and really essential civilian needs through the fall of 1944 without reducing stocks below minimum levels. However this can be accomplished only by a combination of three expedients, as follows:

"Increased takings from foreign sources which are dependent on the probable but not certain, increasing availability of tankers:

"Holding domestic consumption to the minimum essential needs, whereas a moderate increase in these quantities would mean much in increasing civilian comfort and decreasing the burden on public transportation facilities:

"Drawing on domestic fields at production rates which are at, or in some cases in excess of, the maximum at which they should be produced to avoid actual damage to our badly needed underground resources.

In the light of these facts it seems obvious that while the present program shows a balance through most of 1944, it cannot be considered a really safe and satisfactory program, especially if the war should continue through 1944. Certainly the whole situation would be much more satisfactory and have a more adequate factor of safety if means could be found to increase domestic crude production against many possible contingencies."

Most of the report was given over to a survey of working stock requirements in crude oil and its products as compared with present stocks and projected stocks for March 31, 1944. This showed stocks to have been 570,000,000 barrels prior to the outbreak of World War II, 550,000,000 barrels when this

country entered the war; and now down to 48,000,000 barrels. A point was made of the fact that sufficient stocks in total may be hampered by maldistribution as:

"While aggregate working stock requirements probably do not exceed 400,000,000 barrels there are already serious shortages of gasoline in PAW districts I and II, and a considerable surplus of heavy fuel in certain areas. Even allowing for a somewhat better distribution of available stocks as the transportation situation improves, it is evident that the projected stock figure of 452,000,000 on March 31 indicates that we are approaching a point where we can no longer count on withdrawals for stocks to make up for the shortage in crude availability as against projected requirements."

The PIWC committee reported it found the outlook for furnace oils somewhat better than it previously has been and it predicted that, unless the winter should prove very much colder than the average there will be a comfortable supply of these products available. Even should the winter prove unusually severe, the committee contended the availability of additional transportation facilities will make it easier to take care of emergency needs than was the case last winter.

"In view of the evident shortage of anthracite coal in some areas, it would appear that household users in these areas should also be permitted to reconvert to oil if they desire to do so," the committee recommended.

All Officers of API Are Re-Elected

All officers of the American Petroleum Institute were re-elected. The Institute's officers are: William R. Boyd, Jr., president; George A. Hill, Jr., vice president for production, Houston Oil Company of Texas, Houston; vice president for refining, J. Howard Pew, Sun Oil Company, Philadelphia; vice president for marketing, E. V. Weber, Eureka Oil Company, Cincinnati; treasurer, O. D. Donnell, The Ohio Oil Company, Findlay, Ohio; and secretary and assistant treasurer, Lacy Walker, American Petroleum Institute, New York.

The board also elected the members of the Institute's executive committee for the year 1944, as follows: J. A. Brown, Socony-Vacuum Oil Company, New York; R. H. Colley, The Atlantic Refining Company, Philadelphia; H. D. Collier, Standard Oil Company of California, San Francisco; Henry M. Dawes, The Pure Oil Company, Chicago; R. W. Gallagher, Standard Oil Company of New Jersey, New York; Jake L. Hamon, Cox and Hamon, Dallas, Texas; William F. Humphrey, Tide Water Associated Oil Company, San Francisco; J. C. Hunter, Mid-Continent Oil and Gas Association, Abilene, Texas; W. A. Jones, Cities Service Oil Company, Los Angeles; F. A. Leevy, Gulf Oil Corporation, Pittsburgh; B. L. Majewski, Deep Rock Oil Corporation, Chicago; Frank Phillips, Phillips Petroleum Company, Bartlesville; Charles F. Roeser, Roeser & Pendleton, Inc., Fort Worth; W. S. S. Rodgers, The Texas Company, New York; E. G. Seubert, Standard Oil Company (Indiana), Chicago; H. F. Sinclair, Sinclair Oil Corporation, New York; W. G. Skelly, Skelly Oil Company, Tulsa; Reese H. Taylor, Union Oil Company of California, Los Angeles; and R. G. A. Van Der Weude, Shell-Union Oil Corporation, New York.

Members of the Institute elected the following to the board of directors as representatives of the production group:

Pacific Coast: A. C. Mattei, Honolulu Oil Corporation, San Francisco; W. M. Keck, The Superior Oil Company, Los Angeles; L. L. Aubert, Bankline Oil Company, Los Angeles.

Rocky Mountain: B. B. Brooks, The Consolidated Royalty Oil Company, Casper, Wyoming.

Central United States: H. N. Greis, Deep Rock Oil Corporation, Tulsa; Jake L. Hamon, Cox & Hamon, Dallas; E. A. Phillips, Sinclair Oil Corporation, New York; Ralph Pryor, Pryor & Lockhart, Wichita, Kansas; H. R. Straight, Cities Service Oil Company, Bartlesville; R. L. Wheelock, Wheelock & Collins, Corsicana, Texas; H. C. Wiess, Humble Oil & Refining Company, Houston.

Eastern United States: J. Noel Robinson, South Penn Oil Company, Pittsburgh.

Institute members elected the following as refining representatives on the board of directors:

Pacific Coast: J. L. Hanna, Standard Oil Company of California, San Francisco.

Rocky Mountain: P. N. Fortin, Yale Refining Company, Billings, Montana.

Central United States: T. H. Barton, Lion Oil Refining Company, Eldorado, Arkansas; Alexander Fraser, Shell Oil Company, Inc., New York; D. J. Moran, Continental Oil Company, Houston.

Eastern United States: Robert H. Colley, The Atlantic Refining Company, Philadelphia; B. I. Graves, Tide Water Associated Oil Company, New York; W. S. S. Rodgers, The Texas Company, New York.

The following representatives of the marketing branch of the industry were put on the board:

Pacific Coast: Charles S. Jones, Richfield Oil Corporation, Los Angeles; H. D. Collier, Standard Oil Company of California, San Francisco.

Rocky Mountain: W. H. Ferguson, Continental Oil Company, Denver.

Central United States: Henry M. Dawes, The Pure Oil Company, Chicago; I. A. O'Shaughnessy, The Globe Oil & Refining Company, St. Paul, Minnesota; E. G. Seubert, Standard Oil Company (Indiana), Chicago.

Eastern United States: W. T. Holliday, The Standard Oil Company (Ohio), Cleveland; E. W. Sinclair, Sinclair Oil Corporation, New York.

Transportation representatives to the board were elected as follows:

Ships: J. Howard Pew, Sun Oil Company, Philadelphia.

Pipe Lines: D. S. Bushnell, Northern Group of Pipe Lines, New York.

Board members for supply are: Hugh Glenn, Emsco Derrick & Equipment Company, Los Angeles; Wallace Wilson, Wilson Supply Company, Houston.

The board member representing natural gas is: N. C. McGowan, United Gas Pipe Line Company, Shreveport.

Representative for natural gasoline on the board is: D. E. Buchanan, Hanlon-Buchanan, Inc., Tulsa.

Members elected to the board as "at large" representatives follow:

John M. Crawford, Parkersburg Rig & Reel Company, Parkersburg, West Virginia; J. Frank Drake, Gulf Oil Corporation, Pittsburgh; R. W. Gallagher, Standard Oil Company of New Jersey, New York; George A. Hill, Jr., Houston Oil Company of Texas, Houston; A. Jacobsen, Amerada Petroleum Corporation, New York; John M. Lovejoy, Seaboard Oil Company of Delaware, New York; J. F. Lucey, Lucey Petroleum Company, Dallas; R. Ogarrio, The Texas Company, New York; J. Edgar Pew, Sun Oil Company, Philadelphia; Frank Phillips, Phillips Petroleum Company, Bartlesville; E. B. Reeser, Tulsa; H. F. Sinclair, Sinclair Oil Corporation, New York; D. T. Andrus, Pennsylvania Grade Crude Oil Association, Bradford, Pennsylvania (to fill one-year unexpired term of Parker Melvin, resigned); A. F. Corwin, Socony-Vacuum, Wichita, Kansas.

The members of the American Petroleum Industries committee also were re-elected by the board for the year 1944, as follows: Harry T. Klein, chairman, The Texas Company, New York; Edwin S. Hall, secretary, Standard Oil Company of New Jersey, New York; James J. Cosgrove, Continental Oil Company, Ponca City; Cyrus S. Gentry, Shell Oil Company, Inc., New York; L. A. Gibbons, Union Oil Company of California, San Francisco;, Walter S. Hallanan, Plymouth Oil Company, Charleston; W. A. Jones, Cities Service, New York; H. T. Klein, The Texas Company, New York; T. Rieber, Barber Asphalt Corporation, Salt Lake City; L. S. Wescoat, The Pure Oil Company, Chicago; J. D. Sandefer, Jr., National Stripper Well Association, Breckenridge, Texas (to fill one-year unexpired term in this group).

The board re-elected the Institute's membership committee for 1944 as follows: D. E. Buchanan, chairman, Hanlon-Buchanan, Inc., Tulsa; W. H. Ferguson, Continental Oil Company, Denver; Dana Hogan, Hogan Petroleum Company, Los Angeles; C. P. McGaha, Fain-McGaha Oil Corporation, Wichita Falls, Texas; and Ralph Pryor, Pryor & Lockhart, Los Angeles; George B. Holton, Socony-Vacuum Oil Company, New York; Buell F. Jones, Standard Oil Company (Indiana), Chicago; and William A. McAfee, The Standard Oil Company (Ohio), Cleveland.

Manpower for Oil Production

By JOHN M. LOVEJOY, Chairman,
PIWC Committee on Manpower

THE difference between manpower and horsepower is two legs and a brain. We must have manpower to produce oil to produce horsepower to win the war. Like the Italian laborer who said "I diga da ditch to make a da mon to buy a da food to make a da strength to dig a da ditch." You have heard the expressions, Manpower Pinch, Manpower Shortage, Bottom of the Manpower Barrel, etc. But up to now, these have not meant much to you. Nevertheless, it is a fact that industry today must operate with a very minimum of personnel.

It is my purpose to outline only the broader aspects of the problem as it applies to the producing branch of the oil industry. I shall not attempt to discuss details of any orders or regulations. Oil production activities must be accelerated. That means that in the face of strong competition from other war industries and from the Selective Service System, you as an individual must find the people necessary for this purpose. I do not know the answer, but as I proceed in this discussion will offer a few suggestions.

When the United States entered the War, demand for oil and its products had already reached a high figure. The Industry was geared to a rate of activity which required little or no expansion to meet the immediate requirements of early 1942.

It soon became evident that the problem was not one of expanding crude output, but rather of curtailing it in view of the adjustments made necessary by the submarine campaign particularly off our east coast. The Industry's primary job was to reorganize its transportation system, and to increase manufacturing capacity for high octane gasoline and butadiene.

A further deterrent to the producing branch was the shortage of steel and the consequent reduction of well completions in 1942 to 16,000, as against 32,000 in 1941. Completions in 1943 will run at about the same rate as in 1942.

All these factors made the manpower problems of the producing branch relatively easy of solution. Simple economies and adjustments readily took care of lease operations and surplus drilling crews left for the shipyards and other war industries. Growing recognition of the need for new reserves fortunately preserved exploration personnel without serious reduction through draft deferment.

Presented before the Division of Production, before the Twenty-fourth Annual Meeting of the American Petroleum Institute, Chicago, Illinois, November 10, 1943.

In recent months the picture has undergone rapid change. With greatly increased military demand and with more transportation available, both by tanker and pipe line, there is now demand for oil beyond the Nation's capacity to produce efficiently. Where earlier emphasis had been on transportation and on special refinery construction, it is now on the production of crude oil as it has become apparent that producing activities have not been maintained on a basis commensurate with the national interest.

We are faced with the need of finding and developing more new oil fields and extending production from oil fields through rehabilitation and secondary recovery programs. That means, firstly, greater geological, geophysical and leasing activity; secondly, the drilling of more exploratory wells; and thirdly, the drilling of more exploitation wells. To accomplish this with the limited manpower available will require most careful planning by management.

We must also take into consideration the world-wide problem from the point of view of supplying the petroleum needs of the United Nations from sources other than the United States. Here we find that with the improved tanker situation and greater accessibility of other sources of supply it is possible to use larger amounts of oil from the Caribbean area and from the Near East. But to increase substantially the amounts to be taken from these areas, new wells and vast refinery expansion are needed. Both material and manpower for these projects must be supplied chiefly from the United States. An orderly plan for the recruitment of personnel for foreign operations must be evolved to avoid confusing our domestic situation.

We are reasonably assured of the materials necessary for expanding activity both here and abroad, but we have no assurance whatsoever with respect to manpower. To solve this problem it is first necessary to understand and appreciate it, and then to apply intelligent and coordinated action. This is a job that can only be done by management. The numbers involved are not great. A casual survey indicates that there are about 200,000 employees in the producing branch of the industry divided roughly as follows: Exploration other than drilling about 10,000; Drilling about 30,000; and the balance of 160,000 engaged in operating the wells of the nation. From these, Selective Service will take those of draft age in jobs not classified as critical. You have been advised that P.A.W. has requested WMC to add to its list of critical jobs that of pumper, derrickman, floorman and engineer fireman. If this is granted our problem with respect to Selective Service will be very much improved. Allowing for losses to Selective Service and to other War industries, it would appear that about 35,000 new employees should be recruited during 1944, which figure might be broken down as follows: to replace losses to Selective Service and to other industries 15,000; to provide for expanding operations, 2,000 for exploration—13,000 for drilling and 5,000 for other oil field activities.

These men are not going to spring up out of the ground, but we believe that our needs can be met without retention of those that should go into the armed forces and without harm to other essential War activities. I will list some of the things that should be done by every operator, large or small, with the suggestion that each of you check off the items and satisfy yourself that you are doing everything possible on your own account.

1. Survey your manpower needs, allowing for greater activity in exploration, drilling, secondary recovery and remedial activities.

2. Determine how many and which employees will be subject to draft and those for which you are entitled to request deferment.

3. Study the possibilities of transferring employees from one activity to another.

4. Use more women in all of those activities for which they are qualified. Management has been amazed at the adaptability of women in industry.

5. Encourage your employees to find new workers among their relatives and friends.

6. Relax usual physical requirements

tor new employees so as to fill as many jobs as possible from those physically unfit for military service.

7. Establish contact with local committees or agencies concerned with the placing in private employment of men returned from the Service.

8. Keep your employees informed of the part their company and their Industry is taking in the War program. They must constantly be made to realize that their own part contributes directly to the winning of the War.

9. Don't hesitate to move men up to the next job. Every good man is able to undertake additional responsibilities. Much relief can be obtained by upgrading.

10. Take advantage of the educational machinery organized by Training Within Industry Service of W.M.C. and the State-A.P.I. Vocational programs designed for training both experienced and inexperienced workers.

11. Prepare Replacement Schedules or Manning Tables depending on your number of employees. These tables are not only necessary but exceedingly helpful.

12. Arrange your work schedules so that you get a full day's work from all your employees.

13. Adopt the 48 hour or longer workweek wherever manpower economies can be effected.

14. Study all of your producing properties with the object of consolidating operations with your neighbors. Very real saving in manpower can be effected through pooling of oil field personnel.

15. Familiarize yourself with all regulations pertaining to manpower matters. Ignorance of your rights and obligations is inexcusable.

The Industry and the Government is organized to help you in these matters. The Petroleum Industry War Council Committee on Manpower and its Subcommittee is national in scope and representation. Its function is to assemble educational and informative material for distribution and to provide direct contact with the Divisions of PAW and its office of Labor Counselor. This Committee does not overlap or conflict in any way with the District Industry Committees. It is educational and advisory in nature, considering only matters of policy.

PAW both in Washington and in the districts is organized and prepared to act as the claimant agency on behalf of the employers which come under its jurisdiction. PAW makes such representations as may be necessary, either locally or nationally, with the War Manpower Commission, Selective Service, War Labor Board and other agencies to focus attention on actual or contemplated manpower deficiencies which may affect the Industry program adversely. In addition, PAW on its own initiative is actively engaged in formulating remedial programs to meet such situations. These plans are negotiated with WMC who then assumes the primary responsibility of carrying out administrative details. Both WMC and WLB welcome the cooperation and assistance of PAW in their regional offices as well as nationally. The PAW District Industry Committees' work on job descriptions and replacement schedules is a good example of accomplishment made possible under our Industry-Government set-up.

Your direct contact on manpower matters is the PAW District Director. He or his office will advise with you and will arrange for appropriate representation before local boards or committees. It is through your District offices that all matters of production urgencies and labor priorities are cleared. That office will advise you as to procedures and appeals under Selective Service regulations. In matters requiring clearance through National Headquarters, the PAW Labor Counselor at Washington assumes responsibility for presentation before the Governmental agencies concerned.

The PIWC Manpower Committee has published and distributed to the Industry three pamphlets. The first, "Oil Workers are War Workers," was designed to focus attention of the Industry on manpower matters before they became acute. The second, "Manpower, Review of Orders and Regulations," was prepared to assist particularly units of the industry not large enough to maintain specialists in these matters. The third, a Supplement to the Manual, sets forth the policies of the Salary Stabilization Unit of the Treasury Department in determining salary increases for exempt employees whose work-week has been increased. These pamphlets can be obtained by application to the Petroleum Industry War Council, 1625 K Street, N. W., Washington 6, D. C.

Carl Young has prepared a short article on the educational facilities available within the Industry for training workers, together with comments on the Training Within Industry Service of the War Manpower Commission. This material is included in full as an appendix to my remarks.

I also want to include in my report a letter just received from Frederich H. Harbison, PAW Labor Counselor, which answers questions frequently raised.

I have recently had the opportunity of learning about manpower problems of other industries. The Management-Labor Policy Committee of WMC, consisting of three representatives each of Management, Labor and Agriculture, was requested to make recommendations for either a National Service Act or means to improve the present system. This request came to WMC from high administrative officers who had reached the conclusion a few months ago that compulsory legislation was essential to the maintenance of the War Program. The Management representatives formed an advisory group from ten major industries to join with them in these deliberations. A plan has been worked out which if followed will greatly simplify and facilitate present procedure. The ten representatives of industry were unanimous in their belief that:

(1) The manpower resources of the Nation are adequate to carry forward aggressively the War Program.

(2) The average American will provide greater output under a voluntary system than under one of regimentation and compulsion.

(3) Certain steps by Government leading toward a better understanding by the people of their obligations, elimination of jurisdictional disputes between Governmental Agencies, the placing of clear-cut responsibilities on local communities, are essential to the successful continuation of the present system.

(4) Effective manpower utilization through wise leadership and efficient administration will solve the problem.

In my contacts with other industry representatives I have learned that the oil industry is indeed fortunate in its Government-Industry relationship. Through Industry District Committees, PAW District offices, PAW over-all coordination, and through activities of the Petroleum Industry War Council the oil industry can and does anticipate its manpower problems and move promptly to meet them.

In conclusion I want to emphasize again that, although the machinery for appeal and for remedial action is well organized, primary manpower responsibilities remain with management. The oil producing branch of the Industry is expected to increase its activities. For the purpose of this discussion it is assumed that sufficient materials and profit incentive will be provided for expanding operations. Management must determine through individual units its requirements and take whatever steps necessary to obtain manpower to effectuate these programs. Every possible means of self-help must be exhausted before you are in a position to request special assistance or consideration from PAW or other agencies of Government.

Appendix I
"Training Oil Field Workers"

Any consideration of manpower under present conditions must include the problem of training present workers for better jobs as well as training new or inexperienced workers. Facilities are now

available, ready at our hands, for training both types of workers.

Many of you have heard of the vocational training program now in effect and sponsored by the Divisions of Production and Refining of the American Petroleum Institute, but may not have taken the time to fully inform yourselves on the scope of this program, and the results that have been achieved to date as well as the work currently being carried on. The Institute and its Committees on Vocational Training, and the Industry as a whole, can all be proud of the fact that they have recognized their responsibility to do everything in their power to make available to oil field workers the training facilities afforded by the Federal and State governments under the Smith-Hughes Act of 1917.

This act provided in part that Federal aid could be extended to the different states desiring to organize vocational training programs for adults employed in industrial mechanical trades.

Under this Act, employees in industry can be organized in classes of instruction under the supervision of state vocational boards in cooperation with local public schools. The subjects taught must be applicable to the work of the members in each class. In other words, it would not be possible to organize a class of oil field workers and teach them radio engineering; the subject taught must relate to their current jobs, or some phase of the industry in which they work.

The instruction given must be of less than college grade, and suitable for individuals over 16 years of age. The primary purpose of this instruction is to enable individuals already employed to add to their special knowledge and skill pertaining to their work, and thereby improve their prospects for steady and permanent employment, or prepare themselves for promotion or advancement.

Thus vocational education in an organized way is a joint activity of the Federal and state governments and local public school authorities. Immediate supervision of the work is the function of the state authorities, who expend all funds and provide the necessary administrative staff. These state authorities are usually designated as "State Trade and Industrial Training Departments," or some similar title under the direction of a state director or supervisor.

In 1932, the cooperation of the American Petroleum Institute was sought by representatives of the vocational training departments in Texas, Oklahoma, and Kansas, to assist in organizing vocational training classes in the producing branch of the petroleum industry, and to prepare suitable instructional material. A definite plan of cooperation was developed, limited to subjects pertaining to oil and gas production, natural gasoline production, and pipe line transportation, and refinery operations.

The sponsorship of vocational training work in production is vested in the Institute's Central Committee on District Activities (Production Division), which committee has appointed a subgroup, known as the Committee on Vocational training, composed of representatives of the petroleum industry and representatives of the state vocational training departments. A similar committee has been appointed in the API Refinery Division.

The function of these committees is to select suitable subjects and assist in the preparation of instructional material thereon, in forming classes wherever possible on subjects pertaining to oil and gas production, natural gasoline, and pipe line transportation and refinery subjects. It meets as and when necessary, for this purpose, at the call of the chairman. All instructional material used is subject to the approval or validation of these committees. They have no authority or jurisdiction in administering vocational training in any state. Their functions are purely cooperative.

The actual formulation of instructional material is the responsibility of the state vocational authorities, with the API Committees cooperating in procuring reference data, special assistance when required, and otherwise assisting in developing suitable material on the subjects selected. The state authorities select and employ all teachers, teacher trainers, etc., and are responsible for organizing and administering the classes in their respective states.

To date twenty (20) courses of Instruction on Production and twelve (12) texts and outlines on Refining have been formulated and validated. They cover everything from reviewing simple grammar school subjects such as reading, writing and arithmetic (the three R's) to advanced mathematics, drilling practices, production practices, steam power, compressors, maintenance and repair of mechanical equipment, general refining practices, refinery pumps, distillation, and many other subjects. The State Department of Trade and Industrial Education of Kansas has just completed a course on Oil Pipe Line Transportation which is the most complete compilation of data and information ever assembled on this subject. from selecting the site for pipe lines, to the most minute detail of operation of every department connected with pipe line operations. This course is now in the process of printing.

It should be borne in mind that all of this instructional material was prepared from scratch. There were no previous publications available in the form that is required for teaching vocational training. The immensity of the task can be visualized when I state that several thousand pages of instructional material are now available for teaching purposes and represent several thousand hours and days of unselfish cooperation on the part of these various industry committees.

The enrollment in these classes since the inception of the work is in excess of 40,000 students, divided into over a thousand classes in over 200 centers. The principal states participating in the program are California, Texas, Oklahoma, New Mexico, Kansas, Louisiana, Arkansas, and Pennsylvania.

The training program has been extended to many different states and copies of instructional material have been sent to many foreign countries including India, Russia, England, Peru, Canada and Arabia.

A grand total of 46,552 copies of instructional material has been distributed since the inception of the work up to and including June, 1943.

Classes can be formed in any oil producing or refining area in the United States. API Bulletin D-2-A issued by the API Division of Production in Dallas gives full information on the procedures as well as list of courses that are available on production. Copies of this bulletin are available at the door of this meeting room for those who want them.

Foremanship Training

A complete course is available for teaching or training leaders on the conduct of foremanship training conferences. Complete details are given in API Bulletin D-2-B.

Training Within Industry Service by the War Manpower Commission

The Training Within Industry Service of the War Manpower Commission has facilities available whereby the efficiency of war workers can be increased and a higher quality of performance with greater safety and fewer personnel problems can be obtained. This service was designed to solve—or at least help solve—output, quality, safety, and personnel problems by training supervisors, including gang pushers, leader men, foremen, superintendents, and others, who have supervisory responsibilities.

The Training Within Industry Programs are based on the idea that most manpower problems can be solved by proper training. The Supervisor is in the best position to solve the problems that come within the scope of the average worker if he is properly trained to take advantage of the experience available from others. These programs were developed by practical industrial men whose sole objective was to get more production for war industries through greater skill in supervision. The Training Within Industry Service organization was set up in 1940 for the duration of the war. It is headed by the following industrial relations men loaned by industry.

C. R. Dooley, Socony-Vacuum Oil Company, New York City.

Walter Dietz, Western Electric Company, Chicago, Illinois.

William Conover, U. S. Steel Corporation, Pittsburgh, Pennsylvania.

M. J. Kane, A.T.&T. Company, New York City.

This training has already been given to more than 600,000 war plant supervisors. It is endorsed by the American Management Association and other industry groups in addition to thousands of individual companies where the service has been used.

Three short intensive training programs are offered to supervisors to give them a start in developing:

Skill in instructing workers—"Job Instruction Training."

Skill in improving job methods—"Job Method Training."

Skill in leading people—"Job Relations Training."

Job Instruction Training gives the supervisor practice in how to "break in" men on new jobs. It is claimed that this is a "sure-fire" method of instructing an employee in how to do a job correctly, quickly, safely, and conscientiously. In this program each supervisor gets practice in breaking down the job into simple operations, in making the worker receptive, in presenting the instruction, in trying out the worker's performance, and in following up for results.

Job Methods Training gives the supervisor actual practice in improving job methods by following a proved plan in which he studies each operation in order to combine, rearrange, and simplify details affecting the use of materials, machines and manpower.

Job Relations Training increases the supervisor's skill in leadership by helping

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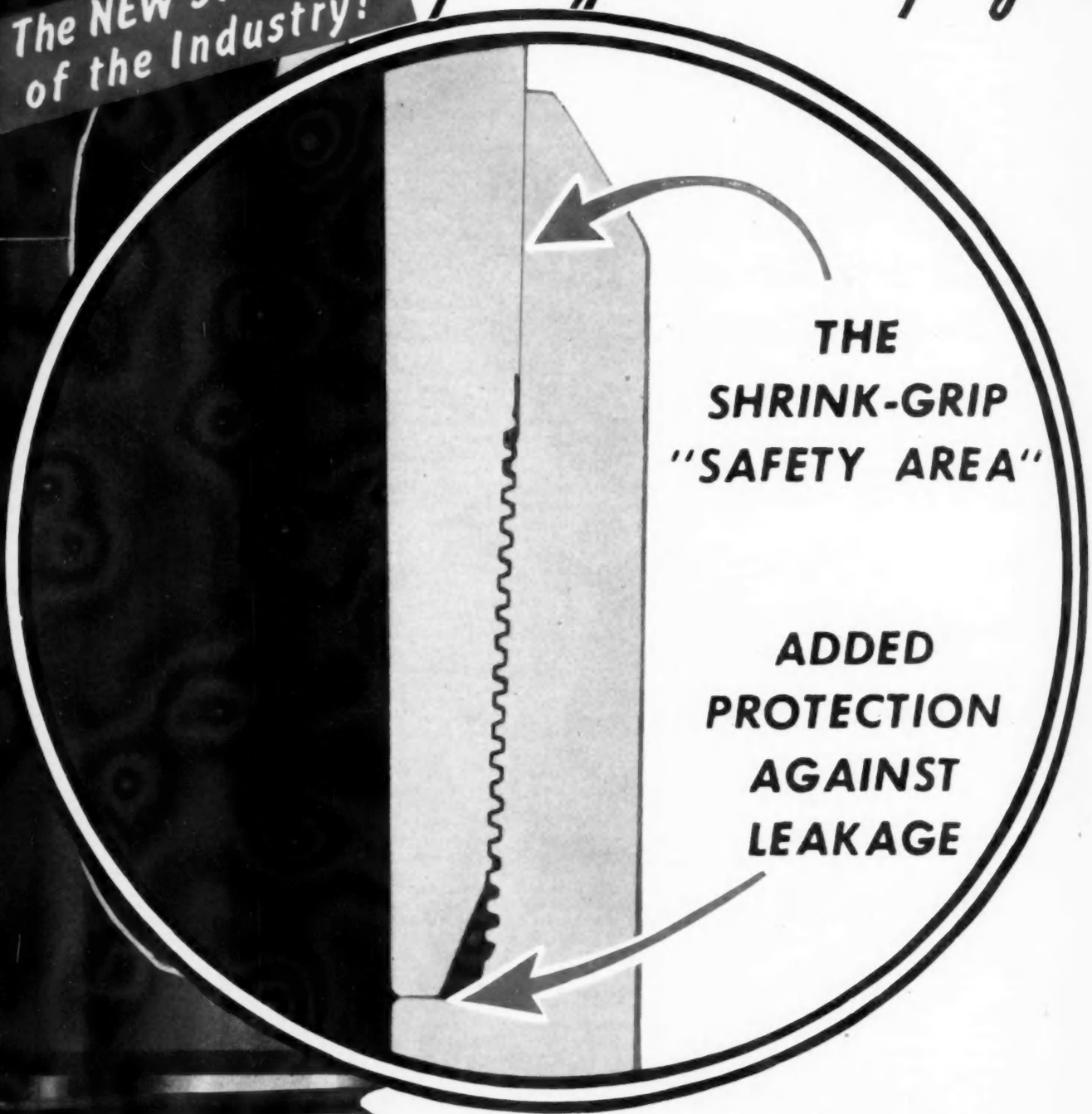

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him to improve his understanding of individuals, to improve his ability to size up situations, and improve his methods of working with people.

These programs do not involve a discussion of theory. Participants spend most of their time actually working on their own problems. There are no standardized rules and regulations to be memorized. A simplified, streamlined plan of procedure to be followed on the job is presented in each program. Following is a typical program on improving job methods:

STEP I—Break down the job.
1. List all details of the job exactly as done by the present method.
2. Be sure details include all:
   —Material Handling.
   —Machine Work.
   —Hand Work.

STEP II—Question every detail.
1. Use these types of questions:
   WHY is it necessary?
   WHAT is its purpose?
   WHERE should it be done?
   WHEN should it be done?
   WHO is best qualified to do it?
   HOW is the "best way" to do it?
2. Also question the:
   Materials, Machines, Equipment, Tools, Product Design, Layout, Work-place, Safety, Housekeeping.

STEP III—Develop the new method.
1. ELIMINATE unecessary details.
2. COMBINE details when practical.
3. REARRANGE for better sequence.
4. SIMPLIFY all necessary details:
   —Make the work easier and safer.
   —Pre-position materials, tools and equipment at the best places in the proper work area.
   —Use gravity-feed hoppers and drop-delivery chutes.
   —Let both hands do useful work.
   —Use jigs and fixtures instead of hands, for holding work.
5. Work out your idea with others.
6. Write up your proposed new method.

STEP IV—Apply the new method.
1. Sell your proposal to the boss.
2. Sell the new method to the operators.
3. Get final approval of all concerned on Safety, Quality, Quantity, Cost.
4. Put the new method to work. Use it until a better way is developed.
5. Give credit where credit is due.

Best results are obtained with groups of 10 supervisors. Five two-hour sessions are required in order to complete each program. The two-hour sessions are led by qualified trainers developed and supplied by Training Within Industry Service. The Training Within Industry district representatives will provide qualified trainers for any company where it is not practicable to provide their own trainers.

The larger companies may have their own trainers especially prepared and coached by Training Within Industry staff members so that each may administer these programs to supervisors within his company. Four eight-hour days are required for development of a Job Instructor Trainer, four eight-hour days for a Job Methods Trainer, and six eight-hour days for a Job Relations Trainer.

There is no charge for the services of Training Within Industry representatives. Address the District Representative in the nearest office shown in the following list for further information. The representative will help you work out details for starting the programs in your company. It should be borne in mind that there is a limited field staff available for this work.

DISTRICT OFFICES
Training Within Industry Service

Atlanta, Georgia
Room 603, Grand Theatre Building
(Hemlock 6890).

Baltimore, Maryland
Room 3106, Baltimore Trust Building
(Plaza 8170).

Boston, Massachusetts
Room 1035, Park Square Building
(Hubbard 0380).

Chicago, Illinois
Room 1265, Adams-Franklin Building
222 West Adams Street
(Andover 3600).

Cincinnati, Ohio
Room 705, Union Trust Building
(Parkway 0100).

Cleveland, Ohio
Room 513, Union Commerce Building
Euclid Avenue and East 9th Street
(Cherry 7900).

Denver, Colorado
Room 551, Equitable Building
(Tabor 3173).

Detroit, Michigan
Room 15, Boulevard Building
7310 Woodward Avenue
(Trinity 1-5500).

Houston, Texas
North Mezzanine Floor
Gulf Building
(Capitol 7201).

Indianapolis, Indiana
Room 915, Circle Tower Building
(Market 8511).

Los Angeles, California
755 Western Pacific Building
1031 South Broadway
(Prospect 4971).

Minneapolis, Minnesota
516 Midland Bank Building
(Maine 3244).

Newark, New Jersey
Room 601, 605 Broad Street
(Mitchell 2-1114).

New Haven, Connecticut
Room 515, 152 Temple Street
(6-5186).

New York, New York
Room 2026
11 West 42nd Street
(Murray Hill 3-6805).

Philadelphia, Pennsylvania
Room 1740, 12 South 12th Street
(Locust 3400).

Pittsburgh, Pennsylvania
Room 360, Administration Building
Carnegie Institute of Technology
(Schenly 2925).

Portland, Oregon
Room 1006, Bedell Building
(Broadway 8471).

Raleigh, North Carolina
Room 112, Raleigh Building,
Fayetteville and Hargett Streets
(2-3306).

St. Louis, Missouri
Room 603
Shell Building
(Central 4206).

San Francisco, California
Room 702, Newhall Building
260 California Street
(Exbrook 0369).

Seattle, Washington
Room 5516 White Building
(Eliot 0200).

Appendix II

Dear Mr. Lovejoy:

In connection with your talk before the API there are one or two general points which you might want to clear up regarding the importance of the petroleum industry with respect to manpower.

It may have been true at one time that the petroleum industry was not given consideration by War Manpower Commission and Selective Service comparable to that given other industries, such as, for example, shipbuilding and aircraft. Today, however, I think that we can safely assume that the essential branches of the petroleum industry are given as favorable, if not even more favorable, treatment by these agencies. There are several instances of specific action to prove this point.

In the first place, on replacement schedules petroleum refineries have been allowed to retain a larger percentage of employees for release after the first six months than has been the case generally with war industries. In general, petroleum companies have fared much better than shipbuilding and aircraft plants on this score. To a large extent, of course, this is due to the higher proportion of skilled personnel in refineries and to the large volume of "throughput" per man. With respect to geological and exploratory personnel, Selective Service has been unusually liberal in granting deferments to key employees on a replacement schedule basis. In addition, there are very few instances of the drafting of professionally and technically trained men at this time. From the standpoint of coverage on the list of critical occupations published by War Manpower Commission, the petroleum industry has, in my opinion, been given consideration equaled only by non-ferrous metal mining.

The arrangements worked out with the WMC in Dallas for the return to drilling of former oil field employees now working in shipyards and other war plants is rather unique. Equal treatment has been secured, to my knowledge, only in the case of critical logging and lumbering on the West Coast, coal mining in the Western States, and to a lesser degree in non-ferrous metal mining. All these industries were experiencing a far more critical manpower situation than has existed in the case of oil well drilling.

By and large, I see no justification for the conclusion that local draft boards have overlooked petroleum workers in the matter of deferments. It is true that many workers in the petroleum industry may have been drafted who should have been retained. Nevertheless, this situation has occurred in all war industries without exception. I might state that the withdrawal of workers from plants manufacturing valves and other critical components for aviation gasoline plants as well as for Navy and Maritime ships has had much more serious consequences than the drafting of men from either petroleum refining or crude oil production.

I mention all this because I feel that sometimes the oil industry likes to complain about the treatment given it by Selective Service and War Manpower Commission. It is true that there were grounds for such complaints in many instances about a year ago. The point which should be stressed now is that the petroleum industry is getting a proper break with Selective Service and War Manpower Commission on most fronts. There are some cases where additional special consideration is warranted, and PAW is willing to call such cases to the attention of these agencies. Nevertheless, the main responsibility for securing proper treatment rests upon the shoulders of the industry. The industry can secure deferments of men if the proper procedures are followed. The industry can solve many of its manpower problems through streamlining training programs, better utilization of labor and other measures within the scope of management responsibility.

The keynote of your talk might be, nevertheless, that the primary responsibility in meeting manpower problems has always rested with the industry and will rest with the industry in the future no matter what government rules and regulations are prescribed.

I have several more ideas which I will bring to New York to discuss further with you.

Sincerely yours,
(Sgd) Frederick H. Harbison,
Labor Counselor, PAW.

Wartime Instruction and Training of Employees

By L. S. WESCOAT, Chairman,
PIWC Great Lakes Region Committee on Protection of Petroleum Facilities,
Chicago, Illinois

THE organization of the Petroleum Industry War Council and the subsequent appointment by it of the Committee on Protection of Petroleum Facilities naturally coincided with the early days of the United States' participation in the war. During the first year our attention was centered largely on the development of direct means of protection of oil properties against the peculiar and obvious risks that war entails. Much of our effort was devoted to cooperating with the military and with the Facility Security Division of the Petroleum Administration for War through the development of substantial amounts of data on the nature, location, size, etc., of petroleum facilities; counseling with these governmental agencies in the development of the standards and methods, which now have crystallized into the broad wartime protection program of the industry; and, finally, disseminating to the industry generally, and more specifically to those facilities which are strategic to the war effort, these standards and methods which have resulted in the creation of guard forces, fencing of properties, re-examination of the background of the personnel, fingerprinting, etc.

These things, of course, are all vitally necessary to any kind of a satisfactory protection program, but many of us have felt that this is merely the framework for a more fundamental approach to the broad problem of adequately insuring the security of the oil plants which are so necessary to successful prosecution of the war.

Just as any organized program ultimately is no better than the enthusiasm and intelligence of the effort it can command, so our wartime plant-protection program is adequately effective only to the degree that every employee has a real understanding that his or her active and intelligent cooperation is vital to its success.

Therefore, I welcome the opportunity of discussing with you some of the things which the PIWC committees have done in the field of educating employees to their wartime responsibilities.

Because the activities of the Great Lakes Region Committee are naturally more familiar to me than those of the other five regional committees, I believe that this best can be done by giving you, in essence, a report of some of the activities of our committee. Although these differ somewhat from the other region committees, we all operate under the broad policies established by the national committee, under the direction of the Petroleum Industry War Council; and, therefore, such differences as exist are a matter of method and emphasis, and not of substance. Thus, when I outline some of our specific undertakings, the principles upon which they are based are operable in the other areas of the country, and all of our activities vary only in detail.

Paper presented to Group Session on Protection of Petroleum Facilities, before Twenty-fourth Annual Meeting of the American Petroleum Institute, at the Palmer House, Chicago, Ill., November 9, 1943.

When the organizational setup of our committee was devised, it was worked out with the thought that it could be utilized both for the purpose of gathering and centralizing information requested by the government and, at the same time, form a sufficiently broad base for carrying on at least a part of the necessary educational program. In this way the very form of our organization is a part of this program.

Great Lakes Region Organization

The Great Lakes Region consists of the states of West Virginia, Kentucky, Ohio, Michigan, Indiana, Illinois, and Wisconsin, which you will note are the seven states comprising the Fifth and Sixth Army Service Commands. Under the direction of the region chairman, a state chairman was appointed for each of these seven states. In three states, viz., West Virginia, Kentucky, and Wisconsin, only single committees (under the direction of the state chairmen) have been formed, as there are relatively few large petroleum facilities in these areas. However, in the other four states where there are sizable concentrations of oil properties, zone organizations have been developed, each covering an area having within it more or less natural concentrations in the form of refinery, distribution, or producing centers. In addition, within the Illinois-Indana refinery area centering in East Chicago and Whiting, a separate group has been organized to operate exclusively in this relatively small area of high concentration.

In developing the membership of the respective committees, there was included direct representation of all large and strategic plants and, in addition, an adequate cross-section of all of the various branches of the industry active in a substantial way within these areas. Thus, if there are five refineries, for example, in a given zone, we have attempted to obtain a representative from each of them to serve on that particular zone committee and, in addition, one or two representatives might be obtained from the terminal and pipe-line operators also serving the area.

As a result the Great Lakes Region Committee consists of well over 100 men, who for the most part are directly engaged either in plant safety and protection work or in the operation of refineries, terminals, producing properties, pipe lines, etc. Although this would be an unwieldy number if our committee functioned in a policy-making capacity, that is not our function. Rather, we are the shock troops which form the vanguard of what should, and I believe can, be a very effective army of the home front.

As the course of the war progressed increasingly favorable to our cause, it became apparent that, at least in the Middle West, the probability of bombing, if not entirely eliminated, was much less likely than it appeared in the earlier months of the war. As a result, the emphasis of our attention became concentrated more completely on means of preventing sabotage and other subversive activities, as well as an accelerated interest in fire and accident prevention.

Fire, of course, cannot truly be called a wartime hazard, particularly in our industry. However, because it is such a potent and ever-present danger in the normal peacetime operation of the oil business, it is a natural tool of the saboteur. During a war, the ravages of

fire have a much deeper and more violent effect because the petroleum industry's resources are so greatly needed, and the replacement of properties means the withdrawal of critical materials from other essential projects.

With this in mind, we felt that an effective contribution could be made toward the wartime instruction and training of employees through the organization of what we called a "fire school." But there were many practical difficulties which had to be met, not the least of which was to develop a course of instruction which would be practical and would permit the demonstration of up-to-date techniques of fire prevention and control on a scale beyond that of the customary classroom illustrated lecture.

As is so often the case, we found that there was a ready-made answer to everything, and more than we had planned. On the West Coast there is a group of men which has been working for many years and which, under the auspices of the Western Region Commitee on Protection of Petroleum Facilities, already had conducted several schools such as we planned. At our solicitation and with the not inconsiderable help of Allen Jergins, from whom you will hear later this morning, arrangements were made through this committee to have six experts—and I use the term literally—from several of the California oil companies come here to compose our faculty.

I know that some of you attended the school, and others have heard of the outstanding excellence of the work done by these men. I have spoken of it publicly before, and cannot refrain from doing so again. You should know their names. They are: H. J. Wilson, Tide Water Associated Oil Company, who headed the group; W. N. Young, Shell Oil Company, Inc., M. B. Anfenger, Standard Oil Company of California; George F. Prussing, then director of the Facility Security Division, District No. 5 of the Petroleum Administration for War; and S. D. Clithero and J. H. McKenzie, both of General Petroleum Corporation, who conducted the field demonstrations.

Invitations to the school were extended to all of the Army Service Commands, except the West Coast, the Office of the Provost Marshal General in Washington, the Coast Guard, the Navy, all of the district offices of PAW Facility Security Division, the Federal Bureau of Investigation, the Office of Civilian Defense, all of the regional committees of the Petroleum Industry War Council, the local police and fire departments, and all of the oil companies operating within the Great Lakes area.

It was originally our intention to limit the attendance to approximately 200, in the belief that it would be difficult to accommodate a larger group and at the same time make the concentrated course of instruction effective. However, the acceptance of the idea of the school was so great that we finally had a registration of in excess of 400, exclusive of a very considerable number of employees of local refinery and terminal facilities who attended the field demonstrations.

How the School Functioned

The school met from May 24 to 26. Morning sessions were held in East Chicago, Indiana — at which lectures, table demonstrations, and motion pictures outlined accepted principles of fire prevention and control. After lunch the school adjourned to the refinery grounds of the Socony-Vacuum Oil Company located nearby, where field demonstrations were held. These consisted of the application of various methods and media in common use and generally readily available to several basic types of oil fires, and demonstrated their relative effectiveness in each situation. Where small-scale demonstrations could be used to illustrate certain principles, this method was followed. However, several situations were produced on a scale as comparable to actual conditions as it is possible to attain in order to illustrate certain techniques which cannot be demonstrated on a limited scale. This latter feature was one of the outstanding aspects of the school, for it enabled those in attendance to witness the handling of a variety of large-scale fires which they would not normally see in a lifetime of work in that field.

After the field demonstrations, the registrants reassembled and were divided into several groups, when an opportunity was given to ask questions of the faculty and for discussion among the attendants.

Seminar

At the conclusion of the regular three-day session, a seminar was held in downtown Chicago for two additional days, when an opportunity was given those who desired to attend to review in greater detail some of the matters covered at the regular sessions of the school. The seminar classes also had the additional objective of affording an opportunity for certain of the attendants to acquire more information on the technique of holding similar demonstrations in other parts of the country.

Distribution of School's Efforts

A short time after the conclusion of the school, a copy of all of the papers delivered at the regular sessions of the school and a comprehensive outline of the field demonstrations were sent to each registered attendant, members of the national committee, chairmen of the regional committees, and all members of the Great Lakes Region, state, and zone committees. In addition, very wide dissemination of the principles of fire prevention and control outlined at the school has been provided through a summary published in the August 26, 1943 issue of the *Oil and Gas Journal*.

Motion Pictures

During the field demonstrations colored motion pictures were taken, and a very useful film has been developed—editing having been done by the members of the faculty. Copies of this picture are being made available to the other regional committees, and later it will be available for the use of other interested groups.

Our Own Job

As in the field of fire and accident prevention, so also in the war-bred task of fighting sabotage and other forms of subversive activity, the great body of men and women actively working in oil plants, in the long run, will determine the success with which the petroleum industry's part in the war on the home front is waged. It is obviously true that the military and the Petroleum Administration for War have a considerable degree of responsibility in this task; but I know they realize, probably more keenly than do we in the industry, that they can do little more than outline the plan of attack. They can give directional impetus to the job which we must carry on, but the day-in and day-out doing of that job is almost wholly our own.

I am convinced that we have all of the necessary tools at hand to make the wartime plant-security record of the petroleum industry a thing of which we can be proud. There is no implication in this statement that there is something lacking in our efforts to this time, or that we have failed to recognize the unusual problems which have grown out of the war. By and large, I feel that most of us believe that a good job has been done. But it is an incomplete job. It is far from finished.

Military and FSD Valiant Service

The military forces of our country and the Facility Security Division have done a splendid piece of work in establishing the standards and practices which form the base of our entire wartime plant-protection program. This was no small undertaking. It was potentially fraught with many misunderstandings and disagreements; but it was accomplished with fine clarity of thought and a high degree of smoothness, when consideration is given to the inevitable complications which are entailed in bringing such plans into beng under the stress and urgency of these days. The entire process was characterized by a genuine effort to understand the prob-

lems which we in the industry faced; and the result, as I have indicated, has given us the present sound security base under which we are operating today.

Government and Industry Agree

Also, I have reason to believe that my colleagues on this platform will agree that they, in turn, have found that the executive and plant management of almost every oil company has given the kind of cooperation that gets work done. I know that in my company we have tried to carry out the requests that have been made of us; and, when we have felt that they were not feasible, prompt and intelligent understanding has quickly resolved our differences on a very workable basis.

Thus, we have the happy situation where those in the government who direct our wartime security efforts and those in industry who implement them are in sound working agreement. But, as I have previously suggested, this only potentially gives consideration to the one place where our plants can actually be protected. Only by enlisting the understanding cooperation of the men and women working in the plants can any program be adequately effective.

You know, as do I, that, with amazingly few exceptions, every person in every oil company in this country is as willing—yes, as anxious—as are any of us in this room to have an active part in this war effort beyond the responsibility of his or her job. One of the peculiarities indicated by this war as against World War I is the ineffectiveness of pure, unadulterated ballyhoo. People are not approaching this war emotionally, superficially or, even as was true in many situations a generation ago, hysterically. Conversely, they are not phlegmatic, halfhearted, or cynical. They view this war with dead seriousness. They see it as a grim, hard, thankless job which they did not want but, having had thrust upon them, seek to complete efficiently, quickly and, above all, thoroughly.

Responsibility of Management

If you believe, as I do, that this really represents the situation in our industry, then it seems to me that management has an unqualified responsibility to bring to those who are working under its direction a clear, simple, and complete understanding of how they can work in such a way that will help assure the safety of their plants, their jobs, and their lives.

This is nothing more than a roundabout way of saying that we must carry on a regular, concerted and, I hope, reasonably uniform plan of employe education. There are more than one million people working in the industry, many thousands of whom are in the plants which we call strategic. They know one another. They know their plants. They know local conditions better, certainly, than any outside agency can hope to and, in some ways, probably better than the plant management itself. They represent a veritable reservoir of information vital to the real protection of these facilities. I believe that it is the responsibility of management to enlist this help and to secure for the war effort this source of information.

I realize that this adds very substantially to an already overburdened management, and that there are risks involved. I realize that a program of this sort will result in some crackpots making life generally miserable for their fellow-workers. I realize that many times keen perception will be needed to thwart potential injury to innocent people occasioned by the petty jealousy and vindictiveness of other workers. I realize that it opens whole avenues for criticism of the actions of management which would not be present in any sound organizational pattern under normal circumstances. However, it seems irrefutable that we must take these risks if the responsibilities which are peculiar to wartime conditions are adequately to be accepted by the industry.

Radio Also Can Be Used

As part of the activity of our committee, we have tried to make some small beginnnigs in this field. On an experimental basis, we decided to attempt a radio program which would have as its theme the effect of actions by employes, other than the guard forces, on the security of plants. The program consisted of two brief dramatic stories of how the action of single employes succeeded in one case and failed in the other to thwart the efforts of saboteurs. In the "success" story one individual, following the orders which he had received from the plant management, succeeded in saving his plant from serious harm and ultimately was responsible for the apprehension of the saboteur. In the other story the failure of the employe to observe the instructions which were designed for his own, as well as his plant's protection, resulted in his death and the destruction of a vital property. Let me point out, however, that each of these situations was predicated on the assumption that there had been a program of education for employes carefully carried on by the companies.

I realize that the situations which we portrayed were over-simplified and probably, from a dramatic standpoint, savored a bit of the days of Uncle Tom's Cabin, but we were particularly fortunate in obtaining the services of an unusually capable narrator — Nelson Olmstead. The program was broadcast over many of the stations of the Mutual network on the evening of April 13, 1943.

Bulletins Effective

Another effective means of carrying on educational work has been developed by Frank V. Martinek of the Standard Oil Company of Indiana, who is chairman of our Illinois state committee. He has issued up to this time 10 periodic bulletins which are distributed to all employes of that company—outlining tersely, dramatically, and very effectively the part they can play not only in the anti-sabotage program in their own plants, but in the much broader program of the country as a whole. Copies of these bulletins have been distributed to all of our state chairmen, and also have been made available to all of the other region committees, and to the national committee.

There have come to my attention instances of work along this line which are being carried on by other companies. However, I have reason to believe that in some plants the attempt to enlist the aid of employes through the concerted means of an educational program has either been inadequate or entirely absent. I suppose that this is inevitable. But, because it is inevitable, it seems to me to add to the responsibility of our committees. For some time I have been advocating the development, in conjunction with the Petroleum Administration for War and any other governmental agencies which should participate, of a concerted program applied uniformly throughout the industry—to be directed either by industry men or under their guidance. This, of course, is not a small task, and the practical difficulties involved are considerable. However, it is my firm conviction that only through a program involving these principles can we completely fulfill the commitments which are implied in our assigned task.

As I look in restrospect to the similar session which we held just a year ago, it thrills me deeply, as I know it must each of you, to be able to see how much of the road to victory we have traversed in that year. We are well started on the road to winning the war. I say that in no smug, self-satisfied, or complacent sense. We all know that many of the finest youth of our day will never again see the land they are fighting to protect, but we also know that the day of final victory draws closer—and in that knowledge there is either strength or weakness. There is weakness if we slacken our pace or fail to do some of the things we planned in the darker days just past. There is strength if we will but look forward to the goal which is now in view and will press on that that day may speedily be at hand.

PRACTICAL OPERATING *Hints* FOR THE PIPELINER

$5.00 will be paid for each illustrated acceptable contribution. Mail to The Editor, THE OIL WEEKLY, *Houston.*

1. *TRENCHING*

Counterweight Helps Capacity Digging

EVEN with the motive power set as far forward as possible within the limits of the frame, the drag of the scoops on a ditcher tends to cant the unit so that the front wheels lose traction and the load is unequally distributed over the crawler mechanism.

To provide a counterweight with maximum lever arm for holding the front end down against bucket drag, one contractor welds angle iron out ahead of the front frame cross member. The transverse section of this extension is a strap, set vertically, and welded to the angles with a right-angle turn to provide maximum stiffness.

On this support may be ranged as many weighting units as the width will permit. These weights themselves are of cast iron, some 20 inches in diameter, with a slot formed as far as the center to fit over the support bar. With a thickness of 1½ inches, such a unit weighs around 125 pounds, and is not too heavy to be handled. In the illustration, the counterweight amounts to nearly a ton, which, acting through the lever arm from the bracket to the center trunnion of the crawler, counteracts a drag or overturning force at the cutting edge of the ditcher elements of several times that amount.

Being readily removable, the counterweights do not offer additional difficulty in transporting the unit, as might be the case were they permanently attached to the frame.

Extension built ahead of guiding wheels of trencher carries adjustable load of slotted cast iron disks to permit addition of weight when working against maximum overturning force.

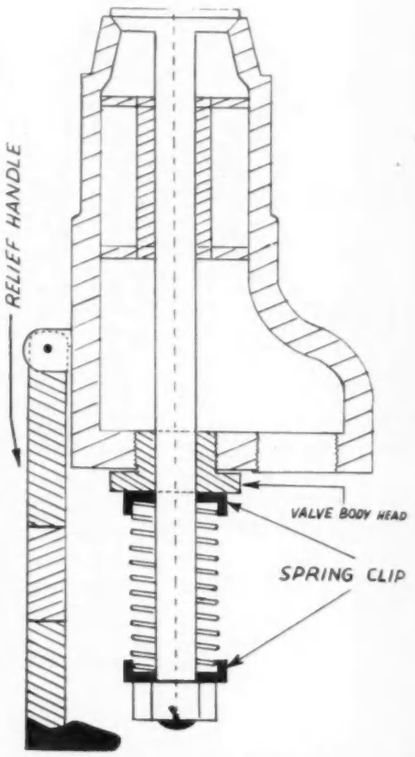
2. *OPERATING*

Unloader Change Aids Maintenance

THE compression relief valve required to permit unloaded starting of units is usually spring closed, the spring being contained within the housing of the valve, and requiring dismantling of the unit in case of spring breakage.

To eliminate the delay at this point, the valve stem was lengthened over the original design, and an outer support or bearing provided at the point where the stem emerged from the case. By placing the spring outside, and working between the outside of the case and a lock nut at the end of the stem, the spring is in full view for quick inspection, the tension can be varied accurately, and replacement made without shutting down the unit.

The relief handle, formed with a cam head to contact the end of the valve stem, was elongated at the same time the stem was increased in length so as to retain the locking feature for controlled unloading.



This spring, shifted from within valve housing, speeds servicing and reduces down time of unit.

Use of the elongated valve stem was also found to shorten the grinding-in period by permitting the valve to be held and rotated by a chuck, instead of requiring a special spanner for the job.

3. *SCRAPER RUNS*

Branch Safeguard Prevents Diversion

WHERE a right-angle branch is made in line pipe, scraper arms and driving disks are prone to hang up on the edge of the opening; or, if flow be through the branch, the scraper itself is apt to attempt to turn with the stream, and the resulting jam usually requires a torch before throughput may again be routed.

If the aperture in the side outlet be bridged with bars parallel to main line axis and spaced closely enough to control the expansion of the driving disks, the scraper will be held to the straight line and flow diverted as desired.

Round bars, rather than flat strips, are

HAYSTELLITE INSERTS
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Good bits, correctly set with Haystellite inserts and faced with Haystellite tube rod, assure maximum round-trip footage of out-to-gauge hole.

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Haystellite cast tungsten carbide inserts are available in thirteen standard sizes and shapes. One type is shown here, actual size.

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Buckeye Trenchers minimize right-of-way work. Dig in any soil. Ruggedly constructed. Faster. Readily maneuvered. Model 12 (shown) for gathering, gasoline and small natural gas lines. Models 32 or 48 for main lines. The standard trenchers for pipeline work.

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Bartlesville, Okla., Box 149

Round bars, welded within branches of large pipe, form grille which prevents detouring of pipe-line scraper when flow is taken through side outlet instead of following direct line.

used to form the guides, as the sharp edges of strips tend to cut or shave the driving disks, while the round bars offer minimum wearing surface and, in most crude-carrying lines, are soon coated with a sheath of paraffin which acts as lubricant and prevents direct contact between disk and bar during the transit of the scraper.

4. PIPE LINES

Dual Line Mounting Saves Relocation

WHEN ground or hydraulic level conditions require the carrying of a pipe line above the surface, advantage sometimes can be taken of supports for other pipes, or even of lighting or telephone poles, if the direction coincides with that of the pipe.

One tank farm utilizes the poles carrying an overhead steam line for supporting a crude line just above ground level with uniform gradient between points of tangency with the earth.

Knee brackets, welded to the steel posts carrying the upper line, are welded in place to maintain the desired gradient, with the pipe aligned as close as possible to the posts to reduce overturning moment. The line is wrapped to reduce variations in length due to temperature changes, and occasional anchors set to arrest any tendency of the line to travel lengthwise.

The anchors used consist of heavy pipe braces, cut to fit around a large arc of contact with the pipe, and welded as carefully as if they, too, were to carry fluid under pressure. The lower ends of the braces are welded to heavy posts, set deep into the earth, and braced further, if necessary, by being embedded in concrete blocks. The paired braces snub line travel in either direction, and cause any temperature change in line length to be absorbed by lateral flexing.

Brackets, carried on grade near base of poles supporting overhead line, permit line to be carried in position for protection against corrosion, accidental damage, or expansion stress.

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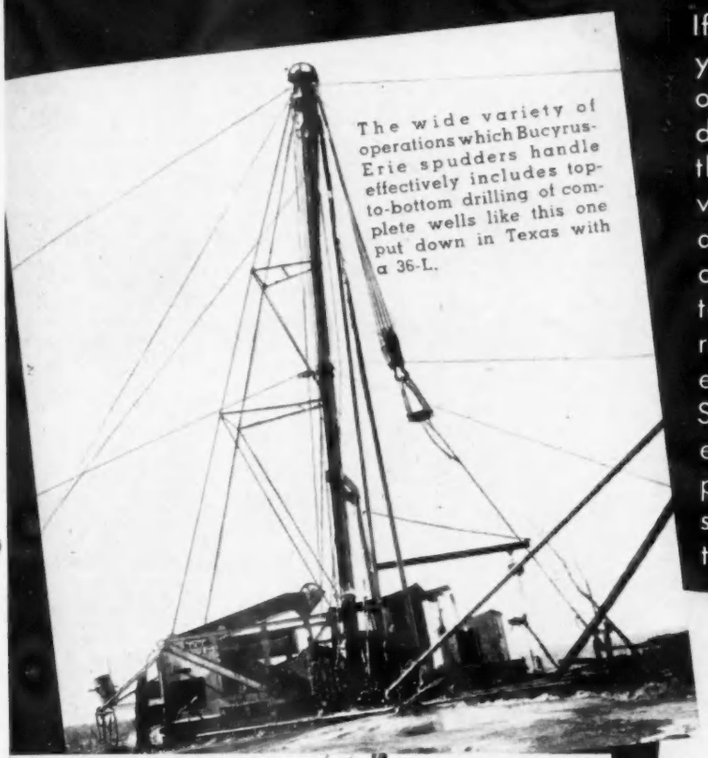
Versatile SPUDDERS

If you want a spudder that will give you top-notch service whatever the operation, one that is easy to tear down, easy to move, easy to set up, then you want one of the modern versatile Bucyrus-Erie Spudders that are making new friends daily because of their all-around effectiveness. In top-to-bottom drilling, tailing-in after rotaries, cleaning out, servicing, deepening, or swabbing, Bucyrus-Erie Spudders give you the kind of low-cost, efficient service that makes every job profitable. Look them over—their versatility will convince you that they're the Spudders for your oil field work.

K-41



The wide variety of operations which Bucyrus-Erie spudders handle effectively includes top-to-bottom drilling of complete wells like this one put down in Texas with a 36-L.

Easy set-ups — they can be made readily by two men — are among the numerous features of modern, all-steel Bucyrus-Erie spudders. This 24-L is being set up for drilling in Michigan.

In addition to top-to-bottom drilling, tailing-in, servicing, swabbing, Bucyrus-Erie spudders are admirably suited for well deepening, the operation shown being done on an Illinois well.

Bucyrus-Erie

SOUTH MILWAUKEE, WISCONSIN, U. S. A.

PRACTICAL OPERATING *Hints* FOR THE PRODUCTION MAN

$5.00 will be paid for each illustrated acceptable contribution. Mail to The Editor, THE OIL WEEKLY, *Houston.*

1. *MAINTENANCE*

Jig Facilitates Welding of Swages

Inclined shaft of pipe, with slotted arm for flange to support larger diameters, places all welding in downhand position and simplifies field fabrication of units.

WHEN, as is frequently the case now, it is necessary to fabricate the swages and other special fittings required to tie-in new production, a simple welding jig enables the welding to be done downhand, and work thus speeded up.

The fixture consists of a 2-inch pipe, supported at a 45-degree angle, and terminating in a slotted flat bar, around which is run a rim of ½-inch or similar round. The end of the 2-inch serves to locate and carry a collar for making up units having either end of that size, while the slots in the cross member accommodate flange bolts and enable a flange of the proper diameter to be attached to the arm and the nipple of the desired size to be carried therein during the welding operation. The rim on the fixture simplifies the revolution of the work as the weld progresses so that the metal is applied in the easiest position for the work. The rim, being some distance from the work, remains cool at all times, and thus permits turning without the necessity of contacting the welded fitting.

The tacking of the work is accomplished by removing the shaft from the pipe nipples supporting it at 45 degrees, and replacing it in a pair of fittings to hold it vertically, thus permitting the weight of the part to be welded to retain it in place on the larger section of pipe.

2. *FLOW LINES*

Flexible Offset Absorbs Expansion

NOT all field units are equipped to put 360-degree bends in pipe without excessive rigging-up to prevent kinking or distortion of the pipe, while the delay in obtaining shop-made loops practically excludes them from consideration when planning flow lines.

Confronted with excessive expansion changes in its lines from well to treating unit, and thence to lease tanks, one company avoided the trouble of making loops by substituting straight sections of pipe, at right angles to the trend of the line.

These transverse joints, connected into the line with sweep ells, can flex through considerable angles without overstressing the welds at the turns, where stress is concentrated. The lines are supported in saddles on either side of the expansion section, so as to prevent possible wandering of the pipe under repeated changes in length.

The transverse or expansion-absorbing joints are kept within lengths in which the pipe will span between supports on the straight sections without undue sagging.

Traversing three sides of the square, these offset lines, guided to maintain alignment, can absorb considerable change in length through spring in transverse joints of pipe.

3. *SAFETY*

Redesigned Walkway Aids Lease Travel

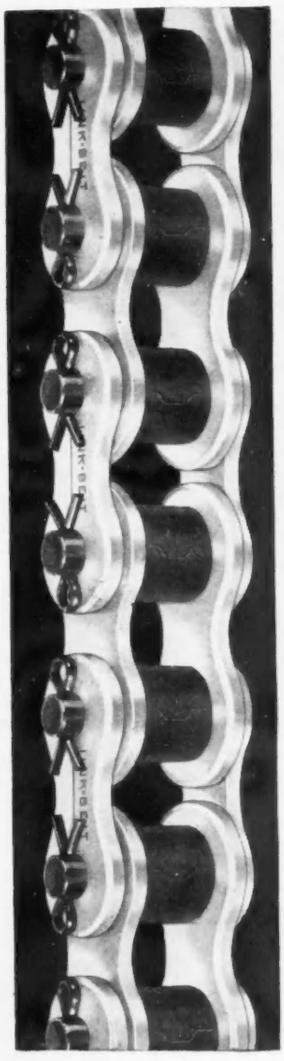
WALKWAYS to tanks, field pump stations and other isolated units are customarily built of 2-inch planks, laid lengthwise, with the ends fastened together with a cleat or splice to prevent leaving a hazard, as would be the case were the boards overlapped to form a junction.

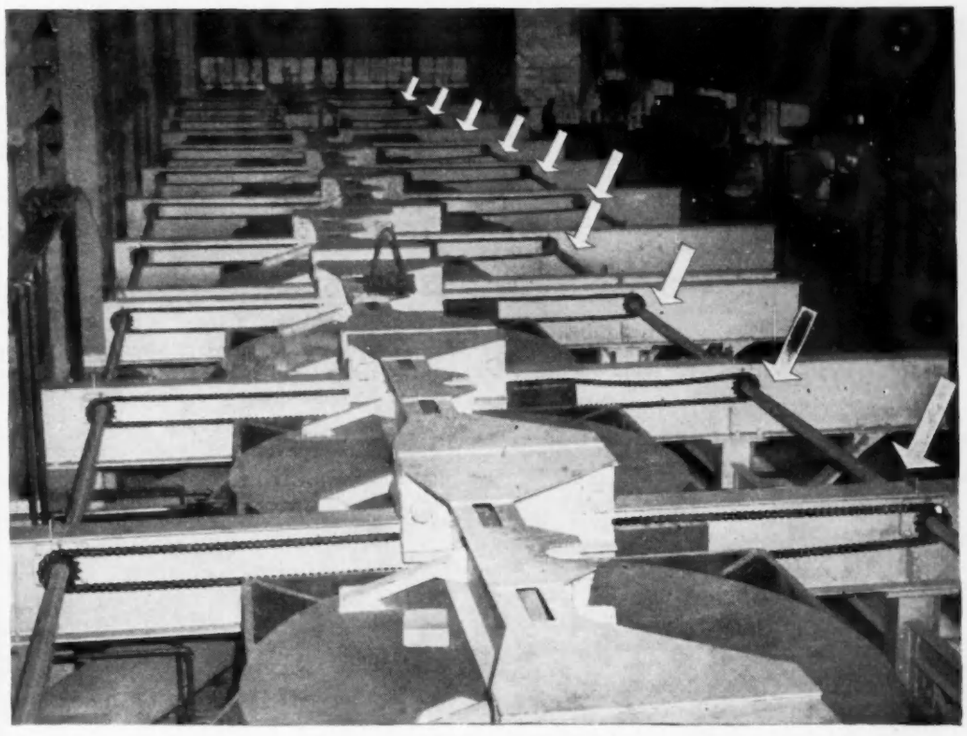
One company varies the usual form of walkway by laying two stringers for foundation, and forming the walk itself of short cross strips of 2 x 12-inch material, cut to a standard 30-inch length. These cross strips are nailed to the stringers, and may be removed for replacement simply by using one unit as heel for a bar while prying up the adjacent piece.

By laying the stringers on edge their life is greatly extended over that when they are laid flat, the walk is protected against warping, and the short cross

Silverlink ROLLER CHAIN

PLAYS VITAL ROLE IN "COOKING" STEEL CASTINGS "TO ORDER"





Above: Silverlink roller chain (1¼" pitch RC-100), on cut tooth sprockets, serves to open and close the covers of 11 hardening and draw furnaces in the new TESCO heat treating plant. Power is supplied by a hydraulic drive.
Silverlink roller chain (1½" pitch RC-120), also drives the transfer car to and from loading and unloading points, and the furnace cars to and from furnaces. Power for these cars is supplied through Link-Belt herringbone speed reducers and Friction Fighter roller bearings.

● Texas Electric Steel Castings Company, specialists in oil industry equipment castings, recently began operations in their new million-dollar heat treating plant, which is equipped with 11 vertical type and four car type furnaces fired by natural gas. Temperature, ranging from 1150 to 1800° F., is observed, controlled and recorded from a remote point through use of the most modern, electrically operated control system.

Link-Belt finished steel roller chains and cut tooth sprockets are used throughout this modern plant .... as drives to open and close the covers for the vertical type furnaces; as drives to operate the transfer car and the four furnace cars .... just another of the numerous types of service Link-Belt Silverlink roller chains and sprockets are satisfactorily performing in this vital industry .... just another proof of the value of 68 years' experience in manufacturing and improving dependable chain drives.

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In cooperation with the government conservation program, Silverlink roller chain is now furnished in a durable "blackout" finish.

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DEPENDABILITY
CONVENIENCE

Patented

This Line Wiper, as illustrated, is available with or without the remotely controlled Packing Nut Tightener. It is the most versatile line wiping and oil saving device of its kind.

The size with 3" bottom connection will allow tools 1¾" OD to pass through it.

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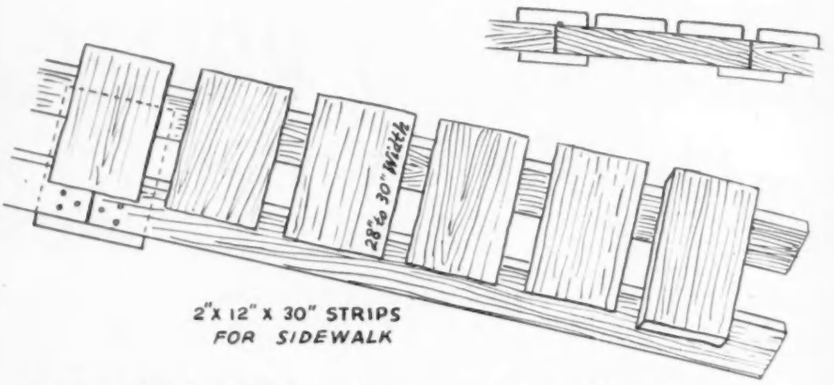
FOUNDERS MANUFACTURERS MACHINISTS
Beaumont, Texas, U.S.A.



Stringers set edgewise, with short treads so spaced as to permit drainage without hazard of tripping, present a longer lasting walk without dangerous warped ends in path.

members may be replaced as required, instead of attempting to patch a long timber in case one end becomes rotten.

The short boards, if nailed with three nails at each stringer, are sufficiently held so that warping is kept at a minimum, and the tread surface is thus kept more nearly level than is possible when long timbers are used—thus reducing the accident hazard, especially for men on the night shifts, when irregularities in walkway surfaces are less noticeable.

4. OVERHAULING

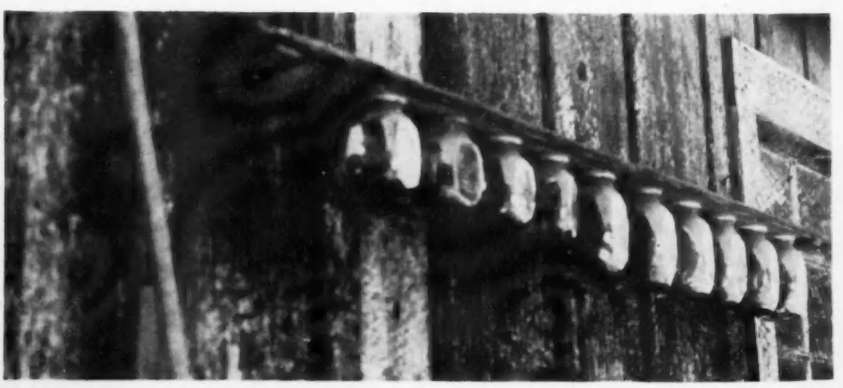
Small Parts Store Prevents Lost Units

PROTECTION of small repair parts against rust, loss and confusing mixtures—which take serious toll of work time when searching for a certain unit—all are avoided by the scheme adopted at one repair shop.

A wide plank is supported at a convenient height above the work-bench, or along the area where reconditioning is to be done, and the screw tops of coffee, salad dressing or other glass containers fastened at intervals to the lower side of the board. By keeping parts separate—as received—in these different jars, proper selection is aided by a view of the material contained in each unit, and it is necessary only to take down such parts as are to be used on a job, without the time-consuming search through miscellaneous small objects which would be required were the items thrown together into one drawer or bin.

The position of the jars, when screwed tightly into the lids, is such as to provide most effective weather protection. Where necessary, a gasket or ordinary jar sealing ring may be kept in place within the lid or on the neck of the jar to provide a seal even more effective against moisture than the mere overhang of lid on the threaded neck of the jar.

Unless care is taken to seal the holes through the lids which admit the fastenings, moisture is apt to seep through and cause damage to stored parts in the jars. This can be guarded against by fastening the lids to the board before mounting, turning the unit over to aid soldering the nails or screws to the metal jar tops.



Screw jar tops, mounted to under side of board, form holders and weather-proofing for individual containers of glass which aid quick selection and prevent rusting of parts.

Conservation and Secondary Recovery Stressed at Technical Sessions

Part of that same unbroken network of supply lines which spans North Africa and extends to within a few miles of the fighting front is that portion of the system which lies within the United States.

To prevent breakdown of these lines in service and to conserve steel and other materials, internal deterioration of these lines by corrosive action must be fought continuously. A symposium of the experiences of 17 companies and affiliates combatting internal corrosion in products pipe lines dominated the Tuesday, November 9, afternoon session of the Division of Production, at the annual meeting of the American Petroleum Institute in Chicago.

T. R. Aude, Stanolind Pipe Line Company, opened the program by suggesting a formula for calculating the throughput of products pipe lines as their capacity was reduced by internal corrosion.

Users of the Hazen-Williams formula express the reduction in line capacity through internal corrosion by changes in the **C** factor. This is not always a clear expression of the condition of the line, inasmuch as any adjustment for the viscosity of the product must also be included in the **C** factor.

The Fanning formula, as modified by Heltzel for crude oil carrying pipe lines, gives accurate results when applied to products lines of new 6- and 8-inch pipe. It is suggested that the introduction of a line-condition factor in Heltzel's formula would make it applicable to products lines of any degree of roughness. In like manner the introduction of an expression for viscosity in the Hazen-Williams formula would make **C** a pure line-condition factor, varying only with roughness.

The following representatives of the systems following their names reported the experiences of the pipe lines indicated in combatting the internal corrosion of products pipe lines:

D. E. Sullivan, Detroit Southern Pipe Line Company; W. H. Simpson, General Petroleum Corporation of California; C. C. Keane, Great Lakes Pipe Line Company; W. F. Rogers, Gulf Refining Company, and Project 5 Pipe Line Corporation; H. M. Stevenson, Humble Pipe Line Company; H. G. Schad, Keystone-Buffalo Pipe Line System; E. A. Koenig, Magnolia Pipe Line Company; J. W. Boyd, Phillips Petroleum Company; S. S. Smith and R. K. Schulze, Shell Oil Company, Inc., and Bayou and Plantation Systems; B. W. Winters, Southeastern Pipe Line Company; F. E. Wood, Standard Oil Company (Indiana); R. L. Harris and E. F. Morrill, The Standard Oil Company (Ohio); and J. M. Pearson, Susquehanna Pipe Line Company.

Permeability as Related to Productivity Index

By NORRIS JOHNSTON,
General Petroleum Corporation, and
JOHN E. SHERBORNE,
Union Oil Company of California

This paper discusses the variables affecting the radial-flow formula quantitatively. The importance of reservoir viscosity of oil is shown to be equal to that of sand permeability itself in determining flow. A modified specific productivity-index function is developed which bears a simple theoretical relationship to sand permeability. Pertinent data on 141 California oil wells on which thorough core-analysis and productivity-index data were available are tabulated. The modified specific productivity-index function is studied graphically for these wells.

Analysis of the data from these wells permits the drawing of a correlation between specific productivity index and permeability for those wells. Factors which influence this relationship were discussed and, wherever possible, were quantitatively evaluated. When insufficient specific information was available, methods and charts were developed and used to predict the value desired. These and other charts useful in computing productivity values were discussed. Possibile differences between California sands and formations occurring elsewhere were discussed, and an effort made to indicate that these might be influential in bringing about the relatively wide divergence from the theoretical homogeneous-flow curve found for the California wells as compared to the smaller divergencies reported upon for wells from regions outside of California.

The authors stated as their opinion, even though the data dealt with comprised a tremendous number of individual investigations, that they are as yet incomplete because of the lack of the necessary quantitative value for some of the factors which are believed to be of major importance. Nevertheless, the correlation thus far developed is thought to have considerable practical utility. The writers believe that not until these factors are more definitely established will the fundamental mechanics of multiphase fluid flow be sufficiently understood.

A New Application of Water Injection for Maintaining Reservoir Pressure and Increasing Natural Water Drive

By WILLIAM L. HORNER, and
D. R. SNOW,
Barnsdall Oil Company

The most important objectives sought for any field are: 1, maximum ultimate yield; 2, maximum production rate per well at minimum cost per barrel. To attain these objectives, control of reservoir pressure is a factor of greatest importance. For this purpose, a method for maintaining original reservoir pressure by increasing the natural water drive was devised and is being practiced in the Midway Field, Arkansas. So far as known, this is the first instance in which injection of extraneous water has been applied to an entire pool—and in the very early stages of its productive life.

This method, the authors state, should be applicable to many other newly discovered or partly depleted oil pools where a deficiency of natural water drive can be recognized or where reservoir conditions are such that artificial water drive could be applied.

Data from the Midway field are presented which demonstrate a certain degree of control over pressure behavior in a large part of the reservoir by means of fresh-water injection. Reservoir pressures were increased in an area one mile in diameter during a period when withdrawals from the pool as a whole were considerably increased. Over the five-month period following initial injection, the average reservoir pressure had fallen at the rate of approximately one-half pounds per square inch per day.

Construction of permanent facilities to inject the required volume of water into 4 input wells is under way in accordance with terms of an agreement between the operators in the field. The investment cost of the project, including the salt-water disposal system, will total approximately one-tenth of the development cost of the field.

The Foaming Tendency and Stability of Crude Petroleum

By W. H. SOMERTON,
University of California

Rapid developments in petroleum technology have opened many new fields for study and research. In any investigation of oil and gas separators, oil-well pumps, gas anchors or any other device or process in which a foam condition may influence the efficiency and effectiveness of operation, a measure of the foaming characteristics of crude petroleum should prove of value.

Foams, like emulsions, are commonly regarded as three-component systems; for they require for their formation not only a liquid phase and a gaseous phase, but also a third substance generally known as a foaming agent. As in emulsions, this third substance is probably a constituent of the crude itself.

Since petroleum foams generally result from a reduction in pressure upon a gas-saturated crude, high-pressure equipment is necessary for an investigation of this phenomenon. The authors describe the types of saturation cells and expansion tubes used and the method of their employ. The types of crudes tested are listed, with physical properties.

Foaming-tendency measurements and those for stability were made concurrently; that is, when the tube was completely filled with foam, it was isolated from the saturation cell and the stability checked under carefully regulated back-pressures.

The authors presented tabulations of test runs on all samples, plotting values obtained against stability and also against viscosity. They conclude from the tests (1) that foaming tendency and foam stability are physical properties of a gas-oil system, and may be measured as such and expressed in comparable units.

(2) The "foaming tendency index" is an exponential function of the back pressure.

(3) Crude oil foams settle out in a near straight-line relationship with time for an average 70 percent of the life of the foam.

(4) Present equipment and methods of measuring foaming characteristic are

applicable only to crudes with gravities ranging between 20 and 40 degrees, API, and with viscosities ranging between 0.07 and 2.50 poises.

(6) The gas-oil foam systems examined appear to be inherently unstable, and the stability of these systems is controlled primarily by the viscosity of the oil.

(7) Foaming tendency is apparently more a function of the nature and composition of the foam system than of the physical properties of the oil.

Secondary-Recovery

The standing subcommittee on secondary-recovery methods of the topical committee on production practice submitted a symposium on criteria for such recovery before the afternoon meeting of the production division on November 9. The symposium was opened by Paul D. Torry, presiding, with an outline of the desired data before undertaking the task of obtaining additional production from a field which has been abandoned or stepping up the production rate in a field with declining rate.

The study of secondary recovery methods requires a systematic approach, particularly if several fields are involved. To simplify this procedure, a detailed schedule of information needed is presented. It is emphasized that all oil fields are not adapted to the application of secondary-recovery methods. Such being the case, it is essential to present information which will assist in avoiding failures, as well as to encourage the use of such methods where the probability of success is high.

Although operation of secondary-recovery projects is not a subject considered in the paper, it was urged that constant vigilance be applied even on the best designed project. Too frequently, little attention is paid to the reaction of the reservoir to the injection of water or gas. Such procedure cannot be approved, as readjustments in reservoir conditions brought about by injection and withdrawal of fluids may make radical changes desirable long before the time of secondary depletion has been reached.

The urgency for increased production of certain types of crude required for the war effort, which may not be secured immediately in adequate quantities by exploration for new fields, and the pressing need for petroleum products near centers of large consumption, provide an important opportunity for the advantageous expansion of secondary-recovery operations. The fact that this can be done many times with a minimum of new materials, by the utilization of existing wells, and by the use of second-hand equipment is a contribution by the oil industry of no small consequence toward the support of the armed forces and the necessities of essential civilian needs.

General data should include complete geographical information on the field, followed by a complete history in chronological order, of any changes in field status, this to extend from discovery well to date of present consideration. Petroleum geology must be as complete as all existing records permit. Core-analyses data; reservoir characteristics and behavior; production data; development and operating practice in the field; water or gas supply for repressuring; and economic considerations —all these must be completed and weighed before the secondary-recovery method be approved.

Preliminiary Field Tests for Determining Required Injection Volumes and Pressure, and Plant Capacity

By JO H. CABLE,
Consulting Petroleum Engineer

Gas injection: A proposed gas-injection project must necessarily include facilities for the injection of gas or air into the producing horizon. Designing suitable equipment requires a general knowledge of the installed producing facilities and an accurate evaluation of the volumes and pressures necessary for a successful and profitable venture. Preliminary field tests and the assembling of comprehensive data are necessary.

The field tests necessary for the design of a gas-injection project include the determination of reservoir characteristics as they pertain to the amount of displacement necessary for profitable results, the required volumes of injected gas to obtain this displacement, and the availability of the necessary injection medium.

Water flooding: A preliminary examination of the project may or may not justify the expenditures necessary for a detailed analysis of the probable increase in recovery and the equipment required to complete the installation. If the survey is justified, it is quite important that one *or more* strategically located wells be cored through the producing horizon.

After theoretical caluculations have been made, possibly after a pilot-plant operation has been studied, the project's maximum volumes and pressures have been determined, and analyses of the available water supplies have indicated the proper treating method, then the design of the plant is simple.

The advisability and design of a water-flooding project should be based on a proper analysis of the information acquired in the field and laboratory.

Geological Factors Involving Secondary Recovery

By CHARLES R. FETTKE,
Carnegie Institute of Technology

In order to analyze the influence that geologic factors have on the secondary-recovery possibilities of a particular pool, the available subsurface geological information and production data should be assembled in graphic form on a structure map on top of the oil sand and on an isopach map of the sand. A number of sections parallel to the long axis of the pool, and at right angles to it, should be constructed. In connection with the study of data, the effects of primary reservoir performance on secondary-recovery possibilities should be taken into consideration. If the preliminary investigation indicates that the pool or tract has secondary-recovery possibilities, a core-testing program should be laid out to check and supplement the geological data on the sand body and to obtain information in regard to the porosity, oil and water saturation, and permeability of the sand.

The amount of oil recoverable by secondary-recovery methods is a deciding factor in determining the feasibility of such an operation. The procedure for its determination is outlined. Sand uniformity in relation to secondary recovery is analyzed. Texture and mineralogical composition of the sand are considered. The influence that shale partings in the sand, the shape and geological pattern of reservoir, structure, and depth of sand have on secondary-recovery operations are discussed. The geologic factors that have to be taken into consideration in selecting the method of secondary recovery best suited to meet certain conditions are pointed out. Limestone reservoirs are discussed briefly.

Many pools possess geological features that permit most efficient exploitation by secondary-recovery methods only when some form of unitization is adopted.

Influence of Fluid Saturation on Secondary Recovery of Oil

By PARKE A. DICKEY,
Forest Oil Corporation

The ratio of gas or water injected to the oil produced is an important factor in the economic success of a secondary-recovery operation. This ratio is governed by the fluid saturation in the sand at the start of the operations. A sand containing a high water saturation may be impossible to flood successfully with water because the injected water-produced oil ratio will be high. However, such a sand may be subjected successfully to gas drive because, for any given oil saturation, the presence of water reduces the injected gas-produced oil ratio.

Unfortunately methods of coring now in use result in samples whose fluid contents have been changed by flushing and gas expansion so that it is impossible, except in certain restricted areas, to use the saturation values as determined in the laboratory to estimate the fluid saturation of the sand. However, by means of core analyses, supplemented by the gas, water, and oil-production history of a sand, it is possible to obtain important information on the choice of a method and the possible ultimate oil recovery.

The greater the remaining oil saturation of a sand, the larger the fraction of that oil that can be recovered by secondary-recovery methods. The cost of producing oil increases as the production per well decreases. For these reasons it is economically important to start pressure-control operations as early as possible in the life of a pool. In the case of old pools the longer secondary-recovery operations are postponed, the higher will be the cost per barrel of recovering the oil.

Prediction of Secondary Recovery from Core Analyses

By R. C. EARLOUGHER,
Geologic Standards Company

Core analyses are essential in the evaluation of any property for secondary recovery. In certain areas where unflushed cores are obtained, the success or failure of secondary recovery may be predicted to a high degree of accuracy from such data. In other areas, where serious flushing and contamination of cores are encountered, the data are of much more limited value at the present time. In this latter case the main value is the determination of net floodable sand; packer or casing point; necessity for shooting; water-input volumes, rate and pressure; pattern spacing; and determination of residual saturation by water flooding.

In those areas where unflushed cores are obtained, the analyses may also be

used to calculate the estimated oil recovery, as well as rate of recovery, to a high degree of accuracy.

One of the most important factors is that of determining the desired shot to be used for sands of different permeability in order to even the flood front through the vertical sand section. Until better means are devised, this appears to be the best way to correct for wide variations in permeability and reduce to a minimum water bypassing through the more permeable sections.

Calculations based on theoretical formulas should be used with great care and caution unless substantial field data are available for correlative purposes.

Influence of Viscosity of Crude Oil on Secondary Recovery

By W. A. HEATH,
Phillips Petroleum Company

The influence of viscosity of oil in governing the rate of flow of the repressure media which, in turn, affects the spacing program and flood life of secondary-recovery projects is discussed. The mechanism of oil displacement by gas and water is presented to show the effect of viscosity of oil in influencing the economic recovery.

The order of magnitude of differences in economic recovery with varying viscosity has not been evaluated in field operations. Within the small range of viscosities in which secondary-recovery operations have been conducted, sedimentation conditions and fluid contents of the reservoir have had more bearing in determining the amount of recoverable oil than viscosity.

Theoretical Calculations for Use in the Installation and Operation of Secondary-Recovery Projects

By GEORGE H. FANCHER,
University of Texas

The present status of the calculations which apply to secondary-recovery which can be made, and which are based upon the theory of fluid flow through sands, is reviewed. Because the basic formulas come from many different sources, all have been converted to practical engineering termiology and correlated in terms of practical field and laboratory units.

Both water flooding and gas injection have been considered in the application of these formulas to the solution of practical problems, with the hope of bridging the gap between theory and practice.

Surface-Tension Effects in Secondary Recovery

By PAUL D. TORREY,
Consulting Engineer

Research performed at the University of Michigan on the physical chemistry of the displacement of reservoir fluids is reviewed with reference to its possible appliction to secondary-recovery methods. Physical conditions under which water will displace oil are discussed, and the effects of polar compounds occurring in the oil in determining the ease of displacement are emphasized.

It is believed that more comprehensive studies may provide a solution to the problem of variable percentage recoveries of the residual-oil content after the primary phase, and also point the way to the recovery of enormous quantities of oil which cannot be produced economically under existing conditions.

Electrical Model Studies of Secondary Recovery

By W. L. HORNER,
Barnsdall Oil Company

The shape of the area within the area swept by an advancing front of the fluid injected has long been of concern to the operators of secondary-recovery systems. Evidence that the rate and amount of recovery can be influenced by the well pattern led to research that has yielded significant criteria for planning, evaluating and controlling secondary recovery.

Electrical models which have been used in secondary-recovery, including cycling, include two principal types:

Electrolytic or ionic mobility

Conductance (electronic or ionic)

and although it is often possible to compute the data which can be provided by the use of these models, they are often found convenient and rapid. The unit is particularly well suited for demonstration of the progress of injected or encroaching fluids through oil and gas reservoirs. Photographs showing the progressive advance of injected fluids have been proved effective means for predicting the shape and efficiency of injection progress and for locating unswept areas which may be produced. Quantitative use of the data derived from electrolytic and conductance models has been used to calculate decline curves for injection operations.

In several instances the encroachment of injected fluid has been determined by field measurements and these data together with production decline curves have been checked against results of electrical model studies. Electrolytic and conductance models have been used for evaluating recoveries and for locating wells and planning injection-withdrawals schedules in a number of cycling operations in condensate fields.

Describing the theory behind the electrical models, the author goes on to show the equations which indicate how the model is able to indicate iso-pressure lines and thus provide reservoir data. Numerical conversion from model to reservoir was shown, followed by a description of the types of models used.

Summarizing his paper, the author stated that the use of electrical models is established practice for cycling and has already been applied to a lesser degree for water-flooding projects. He states his belief that in the future electrical models will also become useful in making special studies of individual well behavior and in three-dimensional problems of secondary recovery.

Economic Factors in Secondary Recovery

By W. B. BERWALD,
The Ohio Oil Company

Secondary oil production is today governed almost entirely by economic factors. In the mind of the average petroleum engineer there is no question from an engineering standpoint as to the possibility of recovering additional oil from numerous oil reservoirs by the application of known secondary-recovery operations. The important question to the owner of oil properties, as well as to the engineer, is whether secondary-recovery operations will be feasible and desirable from an economic standpoint.

Numerous economic factors are involved in determining the feasibility and desirability of secondary oil production from an economic standpoint. Each factor may, and usually does, affect individual owners of properties differently. Because of the wide variety of factors that must be considered, and the variable effect of individual factors in individual cases, only an over-all or general consideration of these factors is important industry-wide.

Most economic factors affecting secondary-recovery of oil also affect primary oil production and, to a large extent in the industry as a whole, secondary oil production may and apparently does depend upon general economic conditions in the primary production of oil. Thus it becomes important in any general consideration of the economics of secondary-recovery of oil to consider also many economic factors that ordinarily are considered only in relation to the primary production of oil.

As a basis for a general treatment of the economics of secondary-recovery, consideration of individual factors has been grouped under two general subdivisions: Preliminary Economic Study and Investigations, and Final Economic Analyses. Under these headings, numerous factors that have some bearing on the economics of secondary oil recovery are analyzed in a general way, in an effort to present and describe the criteria that usually determine the economic feasibility and desirability of such operations.

Few statistics are considered, except in a general way, and an effort is made to show in conclusion that in view of current economic conditions there is an apparent lack of incentive to engage in secondary oil recovery operations, although many prospects might be considered economically feasible.

Through preliminary investigations, reserve estimates, and cost estimates permit a reliable economic analyses of the possibilities of secondary oil recovery. For a given price of future oil, the incentive to develop secondary oil reserves becomes greater as the cost of discovering new primary oil reserves increases. Currently, the discovery cost of primary oil reserves is high and indications are that it will remain high for some time to come. For this reason and generally speaking, the development of secondary oil reserves appears to offer better possibilities for future profit than can be obtained by exploration for and development of new oil reserves. Secondary oil reserves, however, are not large compared to primary reserves, and costs of development often are higher than under primary methods.

Finally, although from an engineering standpoint and from the standpoint of economic feasibility, many secondary oil reserves could be developed profitably; such operations for many reasons are not always economically desirable from an individual operator's standpoint. Currently, these final reasons whatever they might be, perhaps are the best explanation for the apparent lack of incentive on the part of many operators to engage in secondary-recovery operations.

Standardization of Electrical-Log Headings

By W. L. JARVIS,
The Texas Company

Study of the California district subcommittee on core analysis and electrical logging has been in part devoted to the devising of standardized headings for electrical logs. The need for a common heading with some changes and additions to previous and present forms was

realized in attempting to interpret old logs on the basis of information subsequently obtained. This was done with the point of view of making present-day interpretations more effective, and it was found that many pertinent data were lacking.

The paper included a form completely worked out and recommended as an electrical log heading which will include as much of the pertinent available data as is feasible to record. It has evolved to this present condition through several stages, in each of which it was submitted to members of the companies represented by the committee, for circulation among their engineers and geologists, and to the various companies engaged in electrical logging. Consequently it is believed to represent, as nearly as can be reached, a broad concensus of the California industry as to what a desirable heading should contain.

Counterbalancing of Oil-Well Pumping Engines

By EMORY KEMLER,
Purdue University

The subject of counterbalance, although always of general interest to the producing branch of the oil industry, has become more important with the necessity for conserving materials, equipment and labor.

This paper, the outgrowth of material for use in rating of speed reducers, discloses possible codes for field men and engineers. The code for field men as proposed has been prepared with the view of obtaining comments and suggestions of operators and manufacturers. It has been made entirely non-technical, and outlines methods the field men could use to check whether a well is properly counterbalanced or not.

The section for engineers contains a proposed code on methods of making counterbalance calculations, and is intended to serve as a guide for engineers who have such problems to solve. The methods given apply to central powers as well as to individual pumping units.

The paper was illustrated throughout with diagrams of various operating conditions, graphical and mathematical calculations of unbalanced loads, and with a section on dynamometer cards in relation to better equalization of loads..

Building the "Big Inch" Pipe Lines

By BURT E. HULL,
War Emergency Pipelines, Inc.

With a brief historical review of the causes leading up to the authorization and construction of Big Inch and its products-carrying 20-inch mate, "Big Inch Jr.," the speaker then presented selected factual data respecting the engineering features, construction, and operating plan of the two pipe-line systems.

The chronological progress of the Big Inch, from the setting up of temporary offices in Little Rock, Arkansas, to the ultimate delivery of full throughput at Eastern Seaboard terminals was detailed, it being pointed out that but one pinhole weld developed between Longview and the eastern end of the 24-inch pipe at Phoenixville, Pennsylvania.

The speaker discussed the various mishaps which occurred during the construction of the line, the celerity with which each disaster was overcome being an index of the high type of engineering and construction going into the line.

The line operates as a closed system without the use of float tanks at relay points. One tank is provided at each of five stations in the Allegheny mountain region, to permit line drainage in case of emergency, and to relieve possible surges.

A tabulation presented with the paper set forth the principal facilities comprising the two pipe-line systems and portrayed in some small degree the magnitude of the task of replacing lost tanker capacity with pipe-line transportation.

Manpower for Oil Production

By JOHN M. LOVEJOY,
Chairman, Manpower Committee, PIWC

We are faced with the need of finding and developing more new oil fields and extending production from oil fields through rehabilitation and secondary-recovery problems. That means, first, greater geological, geophysical and leasing activity; secondly, the drilling of more exploratory wells; and thirdly, the drilling of more exploitation wells. To accomplish this with the limited manpower available will require most careful planning.

We are reasonably assured, the speaker continued, of the materials necessary for expanding activity, but have no assurance whatever with respect to manpower. Allowing for losses to selective service and other war industries, it would appear that about 35,000 new employes should be recruited during 1944, possibly broken down as follows: replacement of losses to selective service and other industries — 15,000; to provide for expanding operations—2000 for exploration, 13,000 for drilling and 5000 for other activities.

PAW in Washington and the districts is organized and prepared to act as the claimant agency on behalf of the employers who come under its jurisdiction.

Direct contact of the industry is with the PAW district director. It is through his office that all matters of production urgencies and labor priorities must clear.

Concluding, the speaker called attention to the point that every possible means of self-help must be exhausted before requesting special assistance or consideration from PAW or other governmental agencies. It is the opinion of those of us who watch the overall picture that adequate manpower is available. It is the duty and responsibility of management to balance its manpower budget in accordance with activity forecast for coming months.

Drilling Efficiency Under Wartime Conditions

By ARCH H. ROWAN,
American Association of Drilling Contractors

Summarizing rotary activities as of October 25th, the speaker pointed out that the present slowdown in well completions can be attributed to a combination of factors, principal of which are (1) a great many of the wells drilling at this time are wildcat wells, which require a greater length of time than wells drilled in proven territory. (2) The depth of drilling today is generally greater than the depth of drilling in the past two years. (3) The lack of repair parts, the inferior quality of material used in making bits, the shortage of skilled labor, and the use of inexperienced or inefficient labor in the drilling of wells—all these conditions together with governmental restrictions and regulations, are largely responsible for the decrease in well completions, notwithstanding the fact that we now are engaged in an accelerated drilling campaign.

Discussing these three points, the speaker demonstrated that much of the delay comes through inability to repair present and nearly wornout units promptly; through the use of inferior steel for drilling bits, when the actual amount of bit steel lost between reworkings amounts to only 3 percent of the total steel in the unit; and to the fact that serious inroads on the trained personnel have been made by the armed forces and other more publicized war industries.

The speaker advocated better scheduling of drilling operatins, to prevent loss of crews at the end of a drilling contract, and more and better provision for meeting the emergency equipment needs of the industry.

Wartime Instruction and Training of Employes

By L. S. WESCOAT, Chairman,
PIWC, Great Lakes Region Committee on Protection of Petroleum Facilities.

Tracing the organization of the PIWC's committee, the speaker pointed out the methods followed in the development of standards and methods, now crystallized into the broad wartime program, and including such varied items as creation of guard forces, fencing, re-examination of personnel, fingerprinting, and other details.

Using the Great Lakes region as example, the speaker traced the organization for that area, stressing the necessity of having representation from all large and strategic plants and, in addition, an adequate cross-section of all the various active branches of the industry. Such a committee, being composed of perhaps 100 members, would be unwieldy were it to serve as a policy-making agency, as shock troops or vanguard of the home front army, they serve most effectively.

The saboteur as a plant hazard was especially stressed in an area where military bombing became daily a more remote possibility. Emphasis was concentrated more completely on means of preventing sabotage and other subversive activities, as well as an accelerated interest in fire and accident prevention.

A fire school was organized to develop a course of instruction which would be practical and which would permit the demonstration of up-to-date techniques of fire protection and prevention. Patterned after the school of the Western Region, instructors for the school were drawn from that committee's personnel. More than 400 attended the school, in addition to others who attended only the field demonstrations.

The speaker placed responsibility for the situation in the industry squarely up to the management and advocated a uniform plan of employe education. Citing the million or more employes in the industry as a veritable reservoir of information vital to the protection of facilities, methods of reaching them were outlined. Radio, bulletins and meetings are used to enlist employe participation in advanced protection plans.

In closing, the speaker stated "This is no small task, and the practical difficulties are considerable. However, it is my firm conviction that only through a program involving these principles can we completely fulfill the commitments which are implied in our assigned task."

☆ ☆ ☆ ☆ WASHINGTON ROUNDUP ☆ ☆ ☆ ☆

Gavin Starts Move to Force Price Issue in House

Synthetic Fuel Experiments Authorized by Bill

Critical Period of Rubber Situation Ahead

By B. F. LINZ
Washington Correspondent

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WITH oil activities centered in Chicago, oil entered into the Washington picture only in a minor way last week, with Vinson's refusal of a crude price increase still the main subject of discussion.

In the House, Representative Leon H. Gavin, Pennsylvania Republican, gave Vinson a "working over", charging among other thing that the Director of Price Stabilization had "juggled" the facts in order to reach some of the conclusions on which he based his opinion and challenging his authority actually to support, in a financial way, any incentive program developed under his instructions to Ickes.

A progress report on the rubber program showed that the problem of rubber supply has been liquidated but that the hurdles to mass tire production have not yet been overcome and, according to Rubber Director Bradley Dewey, the next six to nine months will be the most critical period in the tire situation. Dewey's report disclosed that the congressional farm bloc, fighting to get a place in the rubber industry for the farmer, has secured one-third of the projected butadiene output for grain alcohol plants, which will produce 230,000 tons of the 690,400 ton total, and the grain plants have been completed with greater rapidity due to the generosity with high priorities.

Other developments of the week included passage by the Senate of the O'Mahoney bill for a $30,000,000 experiment in hydrogenation of coal and announcement of a new pipe line to tap the Elk Basin and Frannie, Montana, fields, the former including the 300,000,000-barrel Tensleep reservoir.

Fewer B and C Coupons After Dec. 1; Same Gallonage

"B" and "C" ration books issued after December 1 will contain fewer coupons than present books but each coupon will be worth five gallons of gasoline, although motorists' allowances will not thereby be increased, it was announced by OPA November 11.

The change is being made to ease the burden on all involved in the rationing procedure, it was explained. Motorists will be able to buy in more convenient lots, dealers will not have to make as many small sales and will not have to handle and paste up as many coupons, and the government will save paper and printing expense. Primary distributors also will be relieved of some work, as will the banks which handle gasoline deposits.

Move Under Way in House to Force Action On Disney Bill to Fix Price

An effort to force action on the Disney bill centralizing oil control in PAW and providing that maximum price for crude shall be on a parity with other commodities is under way in the House, in the shape of a petition to discharge the committee from further consideration of the legislation.

If the necessary 218 signatures can be secured to the petition, the bill can be brought up on the floor for consideration without having to go through the formalities of committee hearings and reports. The measure was introduced last June, but never has been considered by the Banking and Currency Committee, to which it was referred.

At the same time, members from the oil states, angered by Vinson's dismissal of Ickes plea for a 35 cent increase, appear ready to join with Republicans who have embarked on a scheme to keep the House in session until the leadership acts on oil prices and certain other questions which have long been sleeping in pigeonholes. There will be no more two-sessions-a-week operation, they have warned, and the House will have to sit every day from Monday through Friday until it deals with problems for which the public is demanding a solution.

In line with that plan of campaign, an effort to recess over last Wednesday was quashed and, while the Senate enjoyed a two-day vacation, the House listened to a number of speeches, including a highly caustic denunciation of Vinson's oil report by Representative Leon H. Gavin of Pennsylvania.

Gavin started out by denominating the report as "one of the most amazing documents yet from the dozens of emergency, special and extraordinary agencies which keep the American public befuddled with their contradictory statements" and a "long and wearisome treatise."

The Congressman challenged the assurance given by the stabilization director that if Ickes could develop an incentive plan he would put it into operation, declaring that Vinson had no such authority and Congress has never appropriated funds for such a purpose.

"The offer to put such a plan into effect is merely another in the long series of buck-passing antics on this vital question of oil," he said.

"We must now recognize the fact that from the very beginning the bureaucrats had no intention of doing anything to maintain our oil supply," Gavin told the House. "Their philosophy is now coming into the open. It has been from the beginning of this war to the present a consistent program of building up foreign oil development and reducing our own productive capacity to make room for foreign oil here at home. All we need do is to look at what has happened. We have consistently taken oil out of storage here to meet the demand while new development has been discouraged and prevented. At the same time these promoters of the world economy have been running to foreign countries with encouragement and assistance, all the way from the ill-starred Canol pipe line project into which has been dumped an amount said by a Canadian writer to total $138,000,000, to schemes for financial assistance in Mexico, Bolivia, Argentina and many other places.

"But nothing must be done that would enable the American consumer to get a little more gasoline and a little more heating oil.

"The people have a remedy. The Congress has the responsibility of applying it. We have wasted too much time already waiting for a bunch of world-wide planners to give a little practical attention to affairs here at home. Their only cure for the oil shortage is to do without until we can get something from Fort Norman or Afghanistan. Congress, through committees of both Houses, has taken all the evidence it needs and every verdict has been for a raise in price."

A "sympathetic" attitude on the part of congressmen from both the producing and non-producing states on the question of crude prices was reported November 3 by J. D. Sandefer, Jr., of Breckenridge, Texas, president of the National Stripper Well Association.

Sandefer disclosed that he has conferred with a number of congressmen on the subject and expressed the belief that the industry will get price relief only by legislation. The only alternative to the shutting down of stripper wells and the permanent loss of their output, he said, is an increase in price.

"Those responsible for price policy have thought only of the production from new wells," he declared.

"They ignore the high cost milk, the stripper well supply. It is of considerable importance also that the stripper well portion of the industry represents upward of a fourth of our total proved reserves and affords employment to more than 50,000 persons with an annual payroll of $100,000,000.

Southern Montana Fields to Have New Pipe Line Outlet

Construction of an 82½-mile pipe line system from the Elk Basin and Frannie fields in southern Montana to refineries in Laurel and Billings has been approved by WPB and will be started immediately, it was announced November 8 by PAW.

A 6-inch line from each field will merge into an 8-inch line running to 10 miles from Billings and 12 miles from Laurel where it will again split into two 6-inch laterals into those cities. Capacity will be 15,000 barrels daily, and the project will be financed and operated by the Yale Oil Pipe Line Company, of Denver, at a cost of approximately $830,000.

Tensleep reservoir in the Elk Basin field is the largest oil pool discovered in the United States since 1940 with an estimated reserve of 300,000,000 barrels. New wells are now being completed at the rate of about five a month and it is anticipated that the rate of drilling will gradually increase to a peak of ten wells a month next summer. By January, 1944, it is expected 35 wells with an output of between 20,000 and 25,000 barrels daily, will have been completed.

In view of the announced production expansion planned for the Tensleep reservoir, it is expected that additional pipe line facilities will be considered as output is stepped up. A second line may be put under way sometime next spring, when present facilities and the Yale project will be insufficient for movement of the entire production.

O'Mahoney Bill Authorizes Synthetic Fuel Experiments

Without a formal vote, the Senate on November 9 approved the O'Mahoney bill authorizing the Bureau of Mines to undertake a $30,000,000 experiment in commercial production of synthetic liquid fuels from coal and other materials and sent the measure to the House for action.

The bill is merely an authorization for the project and additional legislation actually appropriating the money must be enacted before any work can be undertaken. At least five years would be required for the bureau to construct its plants and operate them long enough to secure the cost and engineering data necessary for the development of a synthetic liquid fuel industry—the purpose of the project.

Debate in the Senate indicated that synthetic gasoline is not looked upon as a contribution to the war oil supply, since it was brought out that it will take 18 months for the bureau to select the locations for its plants and prepare for their construction.

The bill itself carries a provision that the operation is to be conducted "within the limits of critical materials available," and the Budget Bureau made its approval of the project contingent upon the understanding that the building of the plants during the war would not be in accord with the President's program.

Funds with which to initiate the work will be requested in the Interior Department's appropriation bill for the fiscal year beginning July 1, next.

The bureau originally proposed to build three demonstration plants, at a total investment cost of $50,000,000 and with annual operating costs of $7,810,000, but the Public Lands Committee cut the figure to $30,000,000.

United States to Benefit From Reverse Lend-Lease

Reverse lend-lease, by which our Allies provide equipment and commodities for use by our military forces, will bring in rubber and petroleum needed by the United States, Congress was told November 11 in a report by President Roosevelt.

The President's report was submitted a few hours after the release of a British "White Paper" showing England's contribution to the lend-lease program, but gave details which the London document did not contain.

During the past summer, the President said, the United Kingdom agreed to extend its reverse lend-lease aid to include not only goods, services and information for our armed forces, but also raw materials, commodities and foodstuffs hitherto purchased, for export, in the United Kingdom and the British Colonies by or on behalf of United States government agencies.

"This plan will make available to the United States, under reverse lend-lease and without payment, such materials and foodstuffs as rubber from Ceylon, Trinidad, British Guiana and British Honduras; sisal and pyrethrum from British East Africa, asbestos and chrome from Southern Rhodesia, cocoa from British West Africa, tea and cocoanut oil from Ceylon, and benzol and tar acids from the United Kingdom," he hold Congress.

The report gave definite figures on the value of supplies furnished by various parts of the Empire, disclosing that India has furnished approximately $13,127,000 worth of petroleum products—aviation gasoline, motor gasoline, lubricating oil, etc.

Coal May Be Sprayed With Oil to Reduce Windage Loss

Orders prohibiting the use of distillate or residual fuel oil for the spraying of coal have been amended by PAW to permit coal operators to spray residual fuel oil on coal as a means of reducing windage loss and preventing freezing.

It was explained that the relaxation of the order was made possible by recent improvements in residual stocks and that while 1,500,000 barrels of oil a year will be used it will save some 5,000,000 tons of coal by reducing windage losses.

API Takes Lead in Movement to Tell Public About Oil Shortage

Through the facilities of the many trade associations within the petroleum industry a movement was started in Chicago Sunday to take the public into the confidence of the industry. This was the theme of a conference, called by William R. Boyd, president of the American Petroleum Institue.

The general theme of the many speakers was that the all-out effort of the entire petroleum industry to provide all the oil required by our far-flung armies, and our ocean and air fleets, had so absorbed the entire energies of the industry as to prevent keeping the public supplied with oil information equally with oil.

Without petroleum war products in quantity, where and when needed, everywhere on the globe, this war could neither be fought nor won; and it was the sense of the meeting that the time is long overdue for the industry to fulfill its duty to the nation, its customers, by telling them of the outstanding achievements of the petroleum industry toward winning the war and of what may be expected when peace comes.

Sympathy was expressed for public misunderstanding and impatience resulting from conflicting statements emanating from government, quasi-government, and business organizations concerning the reasons and necessity for gasoline rationing and other restrictions affecting the home-front supply and consumption of petroleum products.

Our customers are patriotic citizens eager to make their contribution to the war effort. They will cooperate in any good cause if accurately informed, it was said. But before the public can understand the facts, they first must be understood by the industry itself. Were there some central authoritative clearing house in the industry to which all branches of the industry could give information and in turn receive information, it would be of incalculable assistance in getting the facts before the public simply, directly, and in time to avoid misunderstanding.

The concensus of the trade-association men present was that any central or super-organization for public relations, whether within the frame-work of the Institute or outside of it, would fail; and that the best interests of the industry and the public will be served if each trade association, each oil company, each individual within the industry, will conduct its own public-relations plans and programs in its own way. It was felt, however, that much mutual good would result if friendly meetings of the oil-trade fraternity, such as this one could be continued.

Public relations is everybody's business, it was brought out; and it is the responsibility of every individual within the oil industry to tell the facts concerning the industry.

President Boyd said the Institute's Department of Information stands ready at all times to cooperate with anyone requesting assistance, but that its function is advisory only. If free enterprise is to flourish, each individual must be free to act in accordance with his own judgment. He emphasized that, whereas there are many things about which most oil men agree, there are likewise limitations upon what the Institute can do because of the laws prohibiting. The Institute is an association of oil men organized to promote the arts and sciences of the petroleum industry, to the mutual benefit and understanding of its members, the industry, and the public. The Institute has not in the past, and will not in the future, engage in any practices beyond the scope of these purposes.

Production of Gasoline, Gasoil and Distillates Drops Slightly in Week

Both production of gasoline and gas-oil and distillates showed a slight decline for the week ended November 6. At the same time stocks of gasoline were on the skids again, but not drastically, the total being 68,698,000 barrels as compared with 69,297,000 barrels for the previous week.

There were no other outstanding changes in the stock situation for the week other than all products were lower than refiners would like for them to be. Runs to stills dropped from 4,176,000 barrels to 4,079,000 barrels daily, the decline amounting to almost 100,000 barrels daily. This drop in runs was not a reflection in crude production for the week which ran up to 4,389,000 barrels daily as against 4,383,000 barrels for the previous 7-day period.

Refinery Demands Met

The crude production does not represent the nation's capacity to produce, but does represent the fact that enough oil is being produced to meet demands of refiners. Operators already are gearing their facilities to step up production by several hundred thousand barrels daily by the third quarter of 1944 when refining capacity will be greater and military demands possibly larger.

Production of gasoline for the week ended November 6 totaled 12,172,000 barrels while the output for the previous week amounted to 12,813,000 barrels.

The picture of the gas-oil and distillates was a little better, although not materially changed. Production totaled 4,287,000 barrels as compared with 4,642,000 barrels. Stocks reached 44,776,000 barrels, a slight gain over the previous total of 44,591,000 barrels.

The weekly production of residual fuels stepped up 167,000 barrels to a total of 8,135,000 barrels as compared with 7,968,000 barrels for the previous week. Stocks dropped 287,000 barrels to a total of 63,551,000 barrels as against 63,838,000 barrels for the week ending October 30.

Output of all these products is due to increase within the next four or five months as many new units now under construction go into operation on the Texas Gulf Coast and on the East Coast. Many of the new refineries are being built, however, to supply the ever increasing demands for high octane gasoline and other war products.

Crude Oil Production in the United States

(Estimates compiled by The OIL WEEKLY. All figures indicate daily averages, in barrels)

STATE OR DISTRICT	PRODUCTION IN WEEK ENDED No. 13	Nov. 6
Arkansas	78,100	78,950
California	790,200	790,200
Long Beach	30,750	30,750
Midway-Sunset	56,200	56,000
Kettleman Hills	42,300	42,300
Wilmington	93,850	94,200
Rest of State	567,100	566,950
Colorado	7,300	7,100
Illinois	214,700	227,800
Salem	27,700	29,800
Louden	33,900	35,600
Other New Pools	139,000	151,600
Old Pools	14,100	10,800
Indiana	14,600	13,300
Kansas	288,700	242,500
Kentucky	24,750	25,500
Louisiana	351,150	351,900
North Louisiana	78,800	79,600
South Louisiana	272,350	272,300
Michigan	52,100	51,800
Mississippi	52,300	52,200
Missouri	95	95
Montana	25,900	25,950
Nebraska	1,700	1,700
New Mexico	112,700	112,700
New York	12,800	14,500
Ohio	9,150	9,000
Oklahoma	327,500	330,400
Oklahoma City	51,700	51,700
Seminole Area	34,100	74,000
Rest of State	241,700	204,700
Pennsylvania	40,150	44,400
Tennessee	35	35
Texas	1,924,400	1,924,350
Upper Gulf Coast	524,650	524,500
East Texas Field	376,300	376,500
Rest of Eastern Texas	138,000	138,000
Lower Gulf Coast	197,350	197,250
Southwest Texas	80,250	80,250
South Central Texas	20,700	20,700
West Texas	359,800	359,800
North Texas	141,750	141,750
Panhandle	85,600	85,600
Utah	10	12
West Virginia	8,800	9,000
Wyoming	98,700	97,750
Total United States	4,435,840	4,411,162

Trends of Operations and Changes in Stocks

Figures on crude stocks are from Bureau of Mines weekly reports; all others from American Petroleum Institute weekly reports, which are estimates on Bureau of Mines basis.

(All figures in thousands of barrels—add 000)

HIGHS AND LOWS OF RECENT YEARS

ITEM	Crude Oil Prod. Barrels Daily	Week Ended	Runs to Stills Barrels Daily	Week Ended	Crude Stocks Barrels	Week Ended	Gasoline Stocks Barrels	Week Ended	Gas Oil & Distillate Stocks Barrels	Week Ended	Residual Fuel Oil Stocks Barrels	Week Ended
Highs:												
1939	3,910	8- 5	3,650	10-21	278,607	5-26	87,769	4-22	39,562	10-28	116,237	8-26
1940	3,890	3-16	3,690	6-22	265,865	8-31	102,817	4-20	49,051	10-19	109,135	9-14
1941	4,337	11-22	[1]4,120	10-18	266,187	3-29	99,727	3-29	[1]54,983	11-15	102,448	1- 4
1942	4,337	2- 7	3,961	1- 3	263,208	3-28	[1]109,281	3-14	49,861	11-14	95,857	1- 3
1943	[1]4,412	10-16	4,227	8-28	245,752	5-29	94,159	3-20	44,776	11- 6	72,881	1- 2
Lows:												
1939	[3]1,601	8-26	3,125	2-18	[2]229,127	10-12	71,152	10- 7	20,722	4-15	105,397	4- 8
1940	3,335	11-30	3,370	1- 6	237,339	1-27	79,847	11- 9	23,551	4- 6	102,344	2-10
1941	3,364	1-11	3,490	1-18	240,399	11-15	79,923	10- 4	28,381	4-12	90,914	7-12
1942	3,297	7- 4	3,393	5-23	231,896	12-12	75,934	12- 5	29,240	4-25	72,962	12-26
1943	3,821	1- 9	3,579	3-13	232,191	1- 9	68,182	10-16	30,732	4- 3	63,551	11- 6

TRENDS OF 1942 AND 1943

Trends in Week Ended:	Crude Oil Production Daily	Crude Oil Runs to Stills Daily	Crude Oil Stocks Week End	Gasoline Production Weekly	Gasoline Stocks Week End	Gas Oil & Distillate Production Weekly	Gas Oil & Distillate Stocks Week End	Residual Fuel Production Weekly	Residual Fuel Stocks Week End
1942:									
January 3	4,038	3,961	244,440	13,797	92,987	3,855	49,357	6,918	95,857
January 31	3,871	3,848	250,740	13,292	97,810	3,817	40,674	6,640	91,189
February 28	4,016	3,675	259,373	12,131	105,635	3,799	34,547	6,813	88,285
March 28	3,820	3,667	263,208	11,663	105,624	3,661	31,756	6,344	83,045
April 25	3,581	3,506	257,073	10,535	102,897	3,267	29,240	6,869	81,107
May 30	3,877	3,522	255,023	10,478	95,355	3,034	31,384	6,993	79,628
June 27	3,719	3,581	253,364	10,713	88,396	3,549	32,851	6,615	77,304
July 25	3,691	3,658	249,262	10,864	82,281	3,647	35,966	6,796	77,816
August 29	3,964	3,697	249,007	11,300	80,831	3,850	42,060	6,875	78,034
September 26	3,909	3,802	242,785	10,954	80,550	4,215	45,945	7,094	78,943
October 31	3,901	3,731	239,266	11,153	79,159	.....	48,131	.....	79,166
November 28	3,878	3,736	234,850	11,269	78,854	.....	49,739	.....	77,796
1943:									
January 2	3,871	3,734	233,938	10,957	82,420	4,285	42,913	7,683	72,881
January 30	3,826	3,698	233,863	10,339	88,830	3,888	37,057	7,452	70,763
February 27	3,873	3,709	235,217	10,566	93,157	4,230	32,939	7,839	70,140
March 27	3,896	3,742	239,126	10,231	94,079	3,541	30,980	8,018	67,938
April 24	3,913	3,737	242,035	10,583	91,001	3,954	31,142	8,168	67,455
May 29	3,970	4,679	245,752	10,656	83,937	3,798	32,274	7,672	67,682
June 26	3,955	4,015	242,657	11,092	79,589	3,876	34,044	8,126	67,960
July 31	4,133	3,788	238,420	11,127	74,977	3,765	36,363	8,478	66,877
August 28	4,196	4,227	236,170	12,420	72,525	4,351	37,928	8,732	67,250
September 25	4,344	4,156	233,013	12,206	70,024	4,608	40,328	8,560	66,659
October 30	4,383	4,176	237,219	12,813	69,297	4,642	44,591	7,968	63,838
November 6, 1943	**4,389**	**4,079**	.....	12,172	**68,698**	**4,287**	**44,776**	**8,135**	**63,551**
November 7, 1942	3,838	3,690	[4]239,266	11,006	76,335	4,121	49,034	7,270	79,057
Change:									
In week	+6	—97	+1,221	—641	—599	—355	+185	+167	—287
In year	+551	+389	—2,047	+1,166	—7,637	+166	—4,258	+865	—15,506
In year	+14.4%	+10.5%	—.86%	+10.6%	—10.0%	+4.03%	—8.68%	+11.9%	—19.6%

[1] All time peak. [2] Lowest since April, 1922. [3] Lowest since October, 1922, due to shutdown of six Mid-Continent States. [4] Stocks, October 31, 1942.

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October Completion Rate Shows Gain and Prospects Indicate Continued Strength

Expectation of a seasonal decline in the rate of completions during October failed to materialize, in spite of the sharp drop registered in September as compared with August. Although the accompanying detailed table covers a five-week period, instead of four-weeks of the previous monthly summary, the October completion rate was higher on the basis of day-to-day comparison, showing a daily average of 56.2 wells as against 55 in September.

Of the 1967 October completions, 1616 were accomplished in the four-week period following that covered in the September report, a gain of 76. This gain was especially significant in that it represented an increase of 73 oil wells.

Continuing the comparison of four week periods in September and October, the number of gas well completions dropped from 117 to 112; dry holes rose from 461 to 517; and input and disposal well completions jumped from 135 to 151.

In view of the October reversal of downward trend in drilling operations it seems likely that the remaining weeks of the year will see the racking up of more than 3000 additional completions, for a 1943 total very near the figure of 19,000 offered as an estimate in these pages last summer. This expectation is strengthened by the fact that the pick-up is continuing into November.

Comparing 1943 performance with that of 1942, however, we find a net loss of 2336 completions for the comparable ten month periods. This loss is decidedly out of line with the program that was set up early this year, and indicates that more efective ways and means must be provided for the accomplishment of whatever goal is finally decided upon for 1944. Texas, California, Illinois and Pennsylvania continue to lead all other states in completions, in spite of the emphasis on the need for more intensive exploration and development of other areas.

Cities Service Gas Company Revamping Gas Lines

Cities Service Gas Company is revamping a part of its gas line system in the area of Wichita, Kansas. The work includes taking up, reconditioning and re-laying 16 miles of 16-inch line, taking up and re-laying 11 miles of 20-inch line, and taking up and re-laying two miles of 12-inch.

The contract is being handled by Pipeline Contractors, Incorporated, Tulsa, Oklahoma.

Bethlehem Company Takes Up Gas Line Near Pawhuska

Bethlehem Steel & Supply Company has recently finished taking up 19 miles of six-inch gas line near Pawhuska, Oklahoma. The contract was handled by Pipeline Contractors, Incorporated, of Tulsa, Oklahoma.

WELLS COMPLETED IN UNITED STATES THROUGH OCTOBER

(Figures compiled from weekly reports of editorial staff men, with the following exceptions: California data from A.P.I. except for October; Illinois from Illinois Geological Survey except for October; Indiana from Indiana Division of Geology; Missouri from Missouri Geological Survey; Bradford and Kane-Clarendon, Pennsylvania, from The Producer's Monthly; Tennessee from Tennessee Division of Geology.)

State or District	MONTHLY COMPLETIONS: October 1943 — Details for Oct. 1943: New Wells *Oil	Gas	Dry	Others[6]	Old Wells Deepened	Total Completions: Oct. 1943[1]	Sept. 1943[3]	Oct. 1942[2]	Total Footage Oct. 1943	CUMULATIVE COMPLETIONS: First 10 Months — Details Jan.-Oct. 1943: New Wells *Oil	Gas	Dry	Others[6]	Old Wells Deepened	Total Completions: Jan.-Oct. 1943[4]	Jan.-Oct. 1942[5]	Percent Change, Weekly Average	Total Footage 10 Months 1943	RIGS IN OPERATION — Details for November 1, 1943: Drilling	Rigs Up	Shut Down	Total: Drilling and RU: Nov. 1 1943	Oct. 1 1943	Nov. 1 1942
Alabama												2			2	3	— 34.9	11,127	1		1	1		2
Arizona						4						4			4	2	+ 95.4	11,034	3		1	3	2	
Arkansas	17		4			21	7	20	101,219	100	1	70	2	1	174	185	— 8.14	832,309	38	5	11	43	49	17
California	112	4	26		7	149	148	85	440,937	921	26	351		31	1,329	642	+102.7	4,279,500	297	57	20	354	328	147
Colorado			1			1		4	4,454	10	2	10			22	14	+ 53.4	58,512	17		10	17	17	11
Florida												1			1			715	1		1	1	3	1
Georgia												1			1	2	— 50.0	1.240			1			
Illinois	123	1	87	1	4	216	139	254	563,119	845	11	614	18	34	1,522	1,775	— 16.2	3,784,299	177	21	10	198	189	233
Indiana	15	2	17			34	28	35	60,902	84	7	137		5	233	323	— 29.6	426,711	46	3	8	49	42	77
Iowa																					1		1	
Kansas	95	3	98			196	128	123	657,530	715	25	656	18	21	1,435	1,352	+ 3.82	4,760,482	230	34	11	264	249	172
Kentucky	30		40	1		71	38	16	130,749	164	5	167	3	2	341	127	+162.7	657,662	69	3	3	72	70	48
Louisiana	25	2	17			44	21	57	344,940	260	35	184			479	786	— 40.4	3,425,987	105	7	19	112	104	96
North	4	1	6			11	4	29	58,169	80	26	86			192	360	— 47.9	869,901	30	5	13	35	42	23
South	21	1	11			33	17	28	286,771	180	9	98			287	426	— 34.1	2,566,086	75	2	6	77	62	73
Michigan	20	5	39			64	59	63	174,275	180	43	264		7	494	573	— 15.8	1,265.382	74	22	19	96	110	103
Mississippi			1			1		3	5,464	13		22			35	91	— 62.3	188,317	11	3	3	14	10	11
Missouri			1			1	4	9	433	1	2	19			22	33	— 34.8	19,000	3		1	3	2	2
Montana	7	2	5			14	8	27	34,839	106	35	37			178	174	— .02	386,779	62	8	11	70	56	28
Nebraska																28			3		1	3	1	16
New Mexico	24		6		1	31	36	29	81,747	150	6	60		11	227	331	— 33.0	679,084	78	10	16	88	77	62
New York	81			50		131	74	77	172,473	626	4	5	358		993	1,012	— 38.3	1,359,985	92	30	17	122	117	100
North Dakota																								
Ohio	19	9	22			50	41	85	124,277	122	303	243	1	12	681	913	— 26.9	1,713,385	169	22	40	191	183	202
Oklahoma	53	9	80	12	14	168	135	102	556,324	438	81	539	53	84	1,195	1,188	+ 3.69	3,684,119	303	35	1	338	316	201
Oregon																								1
Pennsylvania	104	25	12	94	1	236	237	301	404,130	1,020	231	82	927	11	2,271	3,341	— 33.6	3,860,922	247	33	56	280	251	327
South Dakota																			1		1	1	1	1
Tennessee											2	4			6	8	— 26.9	6,134	2	2		4	3	2
Texas	260	6	151	3	18	438	364	308	1,745,466	1,828	104	1,420	43	102	3,497	4,541	— 24.7	14,577.100	691	35	97	726	680	504
E. T. Border										13		3			16	12	+ 30.5	100,114	6	3		9	7	6
E. Tex. Field													5		5	16	— 69.4	11,950						
Rest of E. Tex.	17	1	8			26	22	29	132,507	94	4	98		1	197	332	— 41.8	1,068,045	51	8	7	59	44	30
North	66		55	3	5	129	76	69	377,197	359		440	36	31	866	784	+ 8.24	2,338,068	96	4	27	100	115	78
West Central	12		21		4	37	31	31	82,073	91	13	200	1	12	317	311	— .42	719,610	49	1	11	50	56	39
West	77	1	11		9	98	91	74	385,473	595	7	124		48	774	1,247	— 39.3	3,244.013	257	8	26	265	234	142
Panhandle	15					15	12	17	45,355	109	25	22		7	163	326	— 51.2	483,080	39	4	6	43	32	46
Upper Coast	10		17			27	29	21	190.408	138	5	124			267	384	— 30.9	2,049,048	67	1	6	68	66	52
Lower Coast	39	1	21			61	66	38	366,151	297	37	193	1	2	530	686	— 24.5	3,161,973	84	4	8	88	94	72
Southwest	23	3	12			38	30	25	149,686	123	13	173		1	310	355	— 14.6	1,247,016	31	2	4	33	24	28
South Central	1		6			7	7	4	16,616	9		43			52	88	— 42.4	154,183	11		2	11	8	11
Utah																			2		1	2	2	
West Virginia	7	69	17			93	59	50	256,261	67	389	95		18	569	610	— 9.15	1,576,089	61	8	13	69	75	72
Wyoming	6		2			8	10	13	32,738	82	3	18			103	86	+ 17.0	436,537	46	1	6	47	48	44
Total U. S.	998	137	626	161	45	1,967	1,540	1,661	5,892,277	7,732	1,315	5,005	1,423	339	15,814	18,140	— 14.8	48,002,411	2,829	339	380	3,168	2,986	2,481

* Includes distillate wells. [1] Wells completed in 5 weeks, or 35 days, ended October 30, 1943. [2] Wells completed in 4 weeks, or 28 days, ended October 24, 1942. [3] Wells completed in 4 weeks, or 28 days, ended September 25, 1943. [4] Wells completed in 44 weeks, or 308 days, ended October 30, 1943. [5] Wells completed in 43 weeks, or 301 days, ended October 24, 1942. [6] Water input, gas injection, and salt water disposal wells.

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Disposal of Oil Field Waters Studied at Austin Science Meet

An all-day symposium on oil field waters and problems encountered in disposal and injection wells claimed the attention of most of the geologists and engineers who attended the joint A.I.M.E. and Texas Academy of Science meeting, held in Austin, Texas, on November 12.

The first paper of the symposium was read by L. H. Dial, chief engineer of the East Texas Salt Water Disposal Company, Kilgore, Texas, on "Problems of Salt Water Disposal in East Texas." He stated that total permissible oil withdrawals in the East Texas field amount to 383,000 barrels per day, necessitating handling of 365,000 barrels of salt water. This water must be injected back into the formation to maintain reservoir pressure and to avoid pollution of surface streams.

There are now 61 salt-water disposal wells in the field, more than one third of which are owned and operated by the East Texas company. This company gathers the water from a number of adjacent leases and runs it through central treating plants, to salvage cut oil, and to remove dissolved solids and micro-organisms that cause trouble if put back in the pay formation. Injection wells become plugged in spite of clarification and sterilization of the input water, and are cleaned out by backflowing under high pressure, followed by acid treatment. If such procedure is unsuccessful the pay section is under-reamed to remove the plugging substances. The sand will not take sufficient quantities of water by gravity feed alone, so pumps are used.

W. O. George and W. N. White, of the United States Geological Survey, Austin, reported on the results of "Quantitative Studies on Ground Water in East Texas." They discussed various methods of estimating a real extent and volumes of underground supplies, with results comparable to those secured by geologists in studying movement of oil and salt water. Local supply factors are predicted for the areas of Houston, Winter Garden, Texas High Plains, Lufkin, and a number of military zones.

F. W. Rolshausen and F. W. Jessen, of the Humble Oil & Refining Company, Houston, presented a paper on the "Chemistry of Waters Encountered in the Frio Formation of the Gulf Coast." They found that the highest concentration of salts occurs in the upper 300 feet of the formation, and that progressively lower salinity is found with greater depth below that zone. The concentration is between 35,000 and 40,000 parts per million at 4500-5500 feet, and above 50,000 parts per million from 5500 to 6500 feet. Limits of variation in chloride content of Frio brines are from 3180 to 73,000 parts per million. Starr County brines are less saline than those in other areas along the same strike.

Fred Barclay and F. B. Plummer, of the University of Texas, Austin, outlined the results of studies of microorganisms in oil field waters, responsible in varying degrees for the growth of algal and bacterial colonies that obstruct pores in the Woodbine of East Texas, thus plugging the salt water intake wells. The authors reported progress in the identification of these organisms and in the establishment of methods that may be expected to reduce them to comparative impotency.

Paul Weaver, of the Gulf Oil Company, Houston, spoke on "The Need for More Hydrology." He pointed out that while much is known about the water resources of the large underground reservoirs of Texas, there are many other areas in the state where very little is known about shallow water possibilities. These neglected areas may represent comparatively small volumes of water supplies, but they are important to those people and industries that depend on them, and that will depend on them even more as time goes on. As the population of Texas grows, the need for more adequate information will become more pressing, and geologists will have to provide it.

I. W. Alcorn, chief production engineer of The Pure Oil Company, Houston, spoke on "The Closed System of the Handling and Disposal of Oil-Field Waters." He said that since nearly all oil-field waters contain ferrous iron hydroxide in solution, it is essential to either keep it in solution or remove it. Otherwse, when the brine is reinjected into the formaton the hydroxide will precipitate and contribute to the clogging of rock pores. The iron can be kept in solution by introducing inert gases in a closed system, to furnish a blanketing effect. Carbon dioxide, nitrogen or natural gas can be used for this purpose with good results.

U. S. Field Operations

Illinois

Wayne County Well May Produce from Two Sands

A discovery of the Texas Company two miles north of Johnsonville in Wayne County was the highlight in Illinois this week. Hoffee 1, NE NE NE 9-1n-6e, which swabbed 239 barrels of oil in 24 hours from McClosky lime at 3254-57 feet, showed for additional production from the lower O'Hara at 3,192-97 feet.

The O'Hara was tested through 18 perforations in the casing and swabbed 177 barrels of oil in 24 hours with the McClosky plugged off. The Weiler sand, which also apparently carried commerical saturation, may be tested.

Franklin County: One discovery well was completed after long testing, and casing was set for test of pay at another wildcat in Franklin county. Nash Redwine and Sohio Producing Company's Taylor 1, SE SW NW 21-5s-5e, near Whittington, pumped 133 barrels in 12 hours from the Cypress sand on completion to open a new area.

The prospective wildcat was J. W. Murchison's Franklin County Coal Company 1, NE SW SW 11-5s-2e, northeast of Whittington, which on a drill stem test made 190 feet of gas, some oil and 52 feet of oil cut mud from the lower O'Hara at 2,748-84 feet. Casing was set for a test.

Shelby County: A rank wildcat well three miles southeast of the village of Windsor in an area long regarded as favorable has been started by The Texas Company. The well is Ferguson 1, NW SW NE 18-11n-6e and is located on a block of approximately 1,400 acres. The well is ready to drill below surface pipe.

Edwards County: Three wildcat wells received the chief attention of operators in Edwards county this week. Superior Oil Company's Lipper 1, NW NE SE 28-1s-14w, four miles northeast of Albion, was milling out casing to test the Cypress sand. The well set casing for a McClosky test last week after pay was riecovered at 3038-39 feet and promise of commercial was found in the Cypress and Benoist.

The same company's Jack 1, SE SE SW 5-2s-14w, is cleaning out after a squeeze job for a test of the benoist sand. The well, shot with 60 quarts, is expected to make 150 barrels daily when completed.

Whisenant and Trenchard's Ina Dunk 1, NE SE SE 26-2s-10e, more than a mile from the nearest production, which opened a Waltersburg sand pool, took on added importance this week. Virtually ruined when a shot damaged casing, the well was drilled deeper and found saturation in the Tar Springs sand at 2442-50 feet. The operators set casing at 2438 feet and were drilling the plug. An offset to the well, meanwhile, was swabbing 200 barrels daily from Waltersburg.

White County: Slagter and others' Sefried 1-A, NW SE SW 30-3s-11e, in the northeastern part of White County, has been completed as a pool opener in the Biehl sand. After long testing the well pumped 44 barrels of oil in 24 hours from pay at 1850 feet. Total depth was 2400 feet.

Fayette County: The newest and most important discovery in Fayette County in months is being placed on pump for final tests of the Benoist sand. The well is J. J. Callahan and Associates' Littleton 1, NE SW 22-5n-4e, about three miles north of Farina. Before preparations for pumping began, the well swabbed five barrels of fluid per hour. 75 percent oil, from day at 2346-58 feet, which was shot with 40 quarts. Two squeeze jobs were run.

Arkansas

Mt. Holly Field Extended One Mile Westward

Harold Wright's Cox No. 1 well in Section 8-17-18, Mt. Holly Field, Union County, was completed as a producer from the cotton valley formation, extending the producing area a mile to the west. The well is making 200 barrels daily after a squeeze job.

Kerlyn Oil Company has made location for a wildcat test in the Bradley area of Lafayette County. The test will be the International Paper Company 1, C NW SW NW 19-19s-24w. This is in a former producing area which has been inactive for several years.

Kentucky

Activity in Kentucky Gains This Week

Western Kentucky showed an upward trend in oil activity this week as operations jumped from 78 to 82.

Operations included 67 wells drilling, nine locations, four wells rigging tools and two inactive tests. First reports jumped from 11 to 19 and they included six wildcats, three more than were reported last week.

The state's wildcat operations totaled 30, of which 24 were drilling, four were locations, one was rigging tools and one was inactive.

Seven producing wells were completed with total initial production of 1820 barrels. This production was nearly 1500 barrels greater than was recorded last week. Seven holes were dry and one location was abandoned.

Indiana

New Production Continues To Decline in Week

Indiana oil activity showed little change this week with operations in the state totaling 76.

New production continued to decline in comparison with last week's completions. Only three wells were completed and they had total initial production of 238 barrels, nearly 150 barrels of crude less than was initialed in five wells last week.

Mississippi

New Mississippi Lime Pool Indicated by Wildcat

Mississippi lime has been found saturated in Nelson Drilling Company's Fanska 1, C NL NW SW 6-18-1e, to add another pool to Kansas. The formation was topped at 2659 feet, pipe was run and set at 2672 feet and the hole drilled to 2677 feet. From this open hole the well filled 800 feet with fluid, ¾ oil and ¼ water.

Reno County: Skelly Oil Company is extending the North Hilger pool a 40-acre location to the north at their Newby 1, SW NW SW 34-25-4w, which found the Viola lime saturated. Top of the formation was at 4092 feet, where casing was spotted, and the hole was carried on down to 4094 feet with good oil showing in rotary cuttings.

Rice County: Phillips Petroleum Company's Hanson 1, C E½ NW 36-20-6w, pool opener southwest of Bornholdt, is standing with a hole full of oil from Mississippi chat topped at 3308 feet and drilled to 3347 feet. On initial swabbing test the well made 22 barrels of oil hourly, natural.

Reno County: The Texas Company's Hornbaker 2, SW NW SE 32-23-10w, in the Zenith-Peace Creek area, has proven a new pay for the combined fields by finding production in the Arbuckle lime. The lime was drilled to 3747 feet and 5½-inch casing run to 3722 feet. After treating with 1500 gallons of acid, the well pumped 149.5 barrels in 21 hours, less than had been anticipated.

California

Field Extensions and New Shows Feature Wildcatting

New developments in California wildcatting include a new gas field discovery in Butte County, show promising extensions of two oil fields in the Raisin City area of Fresno County and bringing announcement of several new plays of more than ordinary interest because they are located in little tested areas.

The Butte County gas discovery was chalked up by Richfield Oil Corporation in the test of Chico 1, 17-21-1, Chico area wildcat drilled about 2½ miles north of the nearest production. The well blew gas at 13,000,000 cubic feet daily from 4277-4385 feet.

One of the Raisin City district shows was made in Universal Consolidated Oil Company's Taylor 1, 14-15-17, an outpost of about a quarter of a mile southeast from the Seaboard- Tide Water-Union discovery well which recently brought in a new Eocene pool in that area. On a first formation test at 6304-6312 feet, 11 stands of clean oil were recovered. Two other shows up the hole will be tested before completion. The other showing in this same general area was picked up about three miles further southeast in a wildcat seeking a 1½-mile southeasterly extension of the Shell Raisin City pool which produces from

the Miocene. The test, Edwin W. and Harold H. Pauley's 29-21, 29-15-18, recovered five feet of good oil sand in the Lower Ash beds from 4810 to 4815 feet, high enough to suggest it may be well up structure from the discovery well.

The West - Kerman area, Fresno County, comes in for new exploration as a result of field work done in that sector by Amerada. A first test, Mendota Irrigation District 53 - 12, in the northeast quarter of 12-14-16, will be drilled immediately. The area is 2½ miles southeast of that in which Tide Water Associated's Herminghaus some years ago developed showings but failed to make a commercial producer.

Standard of California announced a wildcat spotted in a most interesting location on the Pico Anticline, Los Angeles County. The well, to be a test of possibilities in deeper zones, is to be drilled only a few hundred yards away from the old "No. 4," California's first commercial oil producer brought in 67 years ago. This historied venture, bottomed at 370 feet, made an initial potential of only 25 barrels a day but it was not abandoned until three years ago.

Continuing a search for new gas production in San Joaquin County that already has netted the company several new discoveries this year, Amerada has announced a new test in territory some distance away from its recent Thornton area find. The well is called Blossom Community 1 and is located in the northeast quarter of 32-5-5.

Rocky Mountain Area

East Utopia Discovery Good for 100 Barrels

Montana has an important discovery in the East Utopia area east of the Kevin-Sunburst field in The Texas Company's State 1, NW SE SE 10-33n-4e, in the Ellis-Madison contact at 2550 feet, total depth 2579 feet. The well is estimated at 100 barrels of 18 degree gravity crude daily and the company is installing storage preparatory to testing.

The Texas Company controls 30,000 acres in the East Utopia district blocked almost solidly on an east-west trend through Township 33 North, Ranges 3, 4 and 5 West.

Gebo Test: Continental Oil Company's Unit 1, SW NW SE 23-44n-99w, Gebo Dome wildcat, Wyoming, is drilling Tensleep at 5218 feet, top at 5057 feet. A drill stem test at 5171-5216 feet, open 30 minutes, filled 150 feet with drilling mud and water, and test 5127-5169 feet, open 15 minutes, yielded 270 feet of black oil, estimated 22 degree gravity.

Clarks Lake: Amerada Petroleum Corporation's Clarks Lake wildcat, Hartshorn 1, SE NE SW 15-9n-68w, found entire muddy section 5888-5969 feet oil-saturated but a drill stem test yielded only three stands of mud. The well will be carried to the Sundance, approximately 8000 feet.

South Douglas Creek: Superior Oil Company's important Colorado wildcat test of the South Douglas Creek structure, Dore 1, NE NE SE 13-4s-102w, located seven miles south of the gas discovery Superior iointly made with Continental and Union, was a failure in the Sundance and is being abandoned at a total depth of 7917 feet.

West Texas

Two Counties Show Probable New Pools

Prospects in two West Texas counties are showing for probable discoveries, while the closely followed wildcat in Gaines County appeared doubtful in testing water along with small volume of oil.

Pecos County: The opening of the shallowest Ordovician production in the Permian Basin is promised for the northeast sector of this county through Bryce McCandless et al's Cordova-Union (Gulf) 1-101, near the southeast edge of Oswego, having set pipe at 4093 feet, or 5 feet off bottom, to try for completion through perforations opposite oil saturation in the Ellenburger, topped at 4005 feet, or possibly 4018 feet corrected measurement. This wildcat yielded 2190 feet of fluid, including 1080 feet of oil-and gas-cut water, estimated 15 percent of volume being 35-gravity oil, and balance rotary mud and brackish water, when a tester was used at 4030-85 feet. Depth was later corrected to 4098 feet. Favorable structural position of this wildcat was previously confirmed in logging streaks of oil saturation in Clear Fork (Tubb) lime at 3380-3460 feet, where a blowout showed from 10,000,000 to 20,000,000 feet of gas with spray of high-gravity oil and water. The well probably involves a small and steep structure that is influenced by closely related granite ridge, being on a geological strike with the Wentz 2-well pool.

Gaines County: Honolulu Oil Corporation's Homann 1, 7 miles northeast of the Seminole field, was drilling with tools in lime at 5425 feet, having tested about one barrel of oil and 3 barrels of brackish water when bailed for 7-hour period at 5410 feet. The water discounts the production outlook, although sulphur water has not been reached. Continental Oil Company's Jones 1-A, Ellenburger project for northwest corner of county, drilling 10,280 feet, and The Texas Company's Parmer County School Lands 1, southeast part of county, proved dry in Glorietta and was drilling lime 7110 feet.

Hockley County: Woodley Petroleum Company's Harless 1, situated 21 miles northeast of the Slaughter field, nearest production, tested an average of ½-barrel oil hourly from Clear Fork broken pay at 5879-5952 feet, having plugged back from 5955 feet. Initial treatment with 2000 gallons of acid failed to materially increase the fluid level, and more treatments are scheduled. Brown & Wheeler, Incorporated's French 1 and Globe Oil & Refining Company's Ellwood 1, both Clear Fork tests for the county, were drilling at 5670 feet and 6180 feet, respectively.

Upton County: Texas Pacific Coal & Oil Company's Lane 52-A, McCamey field's first deep test, flowed 24 barrels sulphur water hourly after acidizing the Ellenburger through perforations at 8295-8325 feet, and will test at 8180-95 feet before plugging back to more promising pay in the Silurian. Previous perforations at 8215-48 feet also yielded water.

Oil Discovery: J. B. Hawley, Jr., and Northern Ordnance, Incorporated's Cook 1, Western Howard County wildcat, 4 miles northwest of the Moore-Harding pool, nearest production, settled to 10 barrels daily on the pump after exhausting water absorbed by the San Andres lime pay in drilling to sulphur water at 3555 feet. The hole was plugged back to 3300 feet for a 750-quart nitro shot at 3143-3281 feet. Hawley et al's Wilkinson 1, situated 1½ miles to west, was drilling 2360 feet on the San Andres objective, and Cowden 1, ½-mile from production in Moore-Harding pool are drilling 3250 feet, having logged oil pay at 3185-3230 feet.

Andrews County: C. U. Bay et al's Bitler-Lowe 1, 1½ miles northeast of the Fullerton field, paved the way for the completion of more than a score of additional wells without a dry hole hazard in flowing 15 barrels oil hourly natural from the lower pay at 7058-7199 feet. Acid treatment of the upper pay, topped at 6900 feet with elevation of 3319 feet is underway, and the more prolific bottom pay will be treated separately. This outpost encountered a dip in structure, but is from 60 to 100 feet above the water table. Intermediate acreage will be drilled as soon as rigs become available, as the oil is one of the most popular grades in the Permian Basin. Humble Oil & Refining Company owns lease on a full section between the outpost and the main part of the field.

Mabee Pool: The Texas Company's Mabee 2, 5800 feet southwest of its San Andres discovery pumper now awaiting gauge, was drilling above lime at 4200 feet, and Mabee 3, situated 6500 feet east by north of the producer, was running low in drilling dry lime 4670 feet. The latter logged top of the Yates sand 36 feet low, while Mabee 2 is 3 feet low on this marker.

North Texas

New Strawn Pool Indicated In Archer County

Opening of a Strawn oil pool to the east of Mankins, Archer County, and near a cluster of 4 deep failures is in prospect for George W. Cooper et al's Parkey 1, NE SE SE S. P. Ry. Section 1, A-419. Seven-inch pipe is cemented at 4329 feet, or 4 feet off bottom after an electric log indicated oil production in lime at 4113-18 feet and in sand at 4118-72 and 4331-33 feet. This development was preceded by two Ellenburger failures to the north by G. E. Kadane & Sons, who also recently junked a third tests in Ellenburger at 5055 feet without completing a test of favorable oil saturation in the Strawn series. The latter is 1½ miles southeast of the above prospect. G. E. Kadane & Sons are drilling their fourth test near this junked hole.

J. A. McCarty and J. P. Coleman's Taylor 2-A, north offset to their Ellenburger oil discovery in the Taylor area, logged oil saturation in the Mississippi at 4922-56 and 4972-91 feet and also in the Ellenburger at 5006-11 feet. Pipe has been landed at 4982 feet. This test is lower on structure than the deep strike, discounting possibilities of the oil area extending across the 2-mile interval separating the pool from the

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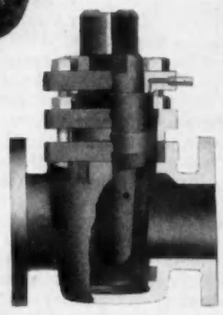

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new strike to the north by George W. Cooper and associates.

Clay County: Shell Oil Company's R. F. Wynn 1, C. Rooney Survey and 2 5/8 miles east of the Stephens 2-well Mississippian pool, proved dry in the Simpson, topped at 6435 feet, and was coring for the top of Ellenburger at 6650 feet. This wildcat instigated spirited lease buying of acreage abutting the discovery block when densely oil-saturated lime was found in the Mississippian, topped at 6174 feet, being 98 feet low to the Stephens pool discovery on this marker. The 261-foot section of Mississippian logged by Wynn 1 carried solid to scattered oil saturation and porosity. These Mississippian strikes generally do not embrace large producing areas, but the average crude yield per acre is attractive.

Hardeman County: Humble Oil & Refining Company's Dodson 1, 3 miles northwest of Chillicothe and first indicated producer for the county, failed to proceed to Ordovician series as originally planned and halted in dry granite-wash at 7301 feet. This wildcat has been plugged back to 6600 feet, with 5½-inch at 6490 feet, preparatory to testing numerous shows passed up in Strawn series and also unidentified granite-wash formations that showed high-gravity oil possibilities when a tester was used at intervals.

Young County: Anderson-Prichard Oil Corporation's Myers 1, J. W. Walsh survey and 1½ miles northwest of Murray, opened a new Marble Falls sand area in flowing 88 barrels of oil natural on ¼-inch casing outlet after perforating pipe at 4254-59 feet, having plugged back from Ellenburger, topped at 4607 feet. This strike is 1¼ miles northwest of the firm's Latimer 1, recent Bend lime discovery, and about the same distance southeast of the Murray 2-pay pool. Field development and exploratory work in Young County has been materially bolstered lately by the entry of new participants, who have been attracted by the comparatively low cost of semi-proved and wildcat acreage. Fairly new companies set up by war-industry companies to invest surplus profits have moved into the county with ambitious programs.

East Texas

Major Extension Looms For Manziel Field

A major extension for the Manziel pool, Wood County's third and newest Paluxy oil area, occurred when Magnolia Petroleum Company's Taylor 1, John Polk survey, recovered 5400 feet of pipe line oil when tester used at 6303-48 feet in Paluxy, topped at 6272 feet with elevation of 472 feet. This outpost is about ¾ mile east and also south of production, and will be carried through the sand before running pipe.

Sun Oil Company's Scoggin 1, previously indicated southwest extension, was carried to upper Glen Rose section at 6610-31 feet for geological information, then cemented pipe at 6463 feet to complete through perforations opposite broken Paluxy saturation entered at 6278 feet with main pay at 6312-60 feet followed by water at 6414 feet.

These two outposts automatically pave the way for considerable drilling in the pool, which has been slow in developing because of comparatively thin sand pay in wells near the discovery. Shell Oil Company's Whatley 1, southeast outpost and scheduled Travis Peak test, drilling 7540 feet, having entered Upper Glen Rose at 6672 feet. The six completed wells are dependent upon tank trucks for a market outlet.

Quitman Field: Shell Oil Company's Goldsmith 7, near west edge of field, completed with rated potential of 292 barrels natural through ¼ inch from Paluxy perforations opposite sand between 6204-6310 feet, having set 4½-inch pipe at 6350 feet. Shell Oil Company's Johnson 1, Josh Robbins survey and an outpost, entered Paluxy at 6266 feet with elevation of 436 feet, and was coring oil sand at 6330 feet.

Wood County remains the most active wildcat center in the district, and latest project involves drilling of Paluxy test by W. A. Moncrief et al on the R. L. Simmons 75-acre tract, H. Nelson survey, mile northeast of Golden. Pure Oil Company holds extensive acreage in the immediate area.

George Sutton et al's Ballard 1, scheduled Paluxy test to southwest of Golden, has not spudded. Danciger Oil & Refineries, Inc.'s, Sparks 1, 3 miles southeast of Winnsboro, was idle for repairs at 4410 feet, having logged Austin Chalk at 4255-4337 feet, and top of sub-Clarksville at 4340 feet. Gulf Oil Corporation's Brewer 1, nearby test, drilling 4550 feet in Woodbine, topped at 4515 feet with elevation of 479 feet, top of sub-Clarksville called at 4128 feet. Plains Production Company's Cox 1, Alba prospect, drilling by junk while bottomed at 8341 feet in Lower Glen Rose. Roy D. Golston et al's Riley 1, situated on southwest strike from Quitman field, idle for repairs at 3030 feet, with tentative Pecan Chalk section at 2688-2930 feet.

Hunt County: Humble Oil & Refining Company's Rutherford 1 failed to reach its Smackover objective in drilling to 7280 feet, and has plugged to near 4800-foot level, where drill stem test in Rodessa zone yielded small amount heavy oil and salt water. Stanolind Oil & Gas Company's Wilkins 1, two miles sonthwest of Commerce, entered lime at 4377 feet, and was coring for top of Paluxy at 4400 feet.

Rains County: Humble Oil & Refining Company's Mainard 1 logged nominal porosity in Rodessa at 7980-8010 feet and was drilling 8438 feet in dry Travis Peak, topped at 8156 feet.

Van Zandt County: Delta Drilling Company's Gipson-Echols 1, 3 miles northwest of Grand Saline and considered an outstanding prospect for lower Trinity production, entered Georgetown at 5264 feet with elevation of 432 feet, and drilling lime 5610 feet. Superior Oil Company of California's Groves 1, which failed to obtain decisive test in Travis Peak, was drilling sandy shale at 8920 feet.

Southwest Texas

Zapata County Wildcat Opens New Area Play

First major lease and royalty development in years is now under way in Zapata County, a county that produces some oil from shallow formations. This interest was accelerated when a wildcat well drilled by George H. Echols recently found several oil and gas sands.

The well is Volpe Estate 1 and is spotted 8 miles east of Zapata in share 1, porcion 32. Echols has set 5½-inch casing to around 6500 feet and is perforating first in sand at 5110-5355 feet. Before setting pipe electrical survey was run and sidewall samples taken. The electrical log indicated a sand showing oil at 1275-90 feet, sand carrying gas odor at 1455 feet, 1995 feet, 2040 feet, and sand with oil odor at 4650 feet. The sand section at 5110-5255 feet is believed to be the best for production and is part of the Wilcox.

Both major and independent operators have leased hundreds of thousands of acres in the area. The shallowness of the sand is a major inducement to the widespread leasing and possible future drilling.

Gonzales County: Amerada Petroleum Corporation and Alder Oil Company are making first flow tests in Morgan & Kunetka 1, wildcat 12 miles south of Gonzales that indicated the opening of a new field. Operators drilled the well to 6726 feet but after running log and taking sidewall samples, decision was made to set 5½-inch casing to plugged back total depth of 6575 feet. This well is 4 miles northwest of Cheapside in south portion of the county.

Nueces County: Another major extension to the prolific Agua Dulce field is looming with Simmonds and Perry completing Fee 1-B, 5000 feet east of 6800-foot production. The well was perforated at 7260-77 feet with 72 shots and flowed considerable gas and condensate but was not gauged. Total depth is 7368 feet with 5½-inch casing set on bottom. Operators skidded rig 2950 feet southeastward to Fee 2.

Goliad County: Continental Oil Company is preparing to drill a deep test in the Cabeza Creek area, the well projected to 9000 feet which will be deep inside the Wilcox. The location is 2 miles south of Cabeza Creek-Wilcox production completed in February, 1943, at 7645-76 feet in Wilcox. It is in Sebastiano Vela survey, drilling to start soon.

Jim Hogg County: The newly discovered Armstrong field is rapidly being defined. Humble Oil & Refining Company has abandoned Strohman 3 on the southwest side of the field. The Humble and Texas Company each have abandoned other wells in the area. However, the latter company has awarded contract for the drilling of Yeager 1, 1½ miles northwest of the field discovery.

Texas Gulf Coast

Wilcox Test Drilling On Humble East Flank

The Texas Company is deepening a flank well on the east side of the Humble field, Harris County, to the Wilcox sand. The well, which is drawing unusual interest, is Stevenson Fee 54 in J. B. Stevenson survey. Operators are now making hole around 7800 feet after setting a string of 7-inch casing to 7475 feet. The well is a south offset to the company's Stevenson 52 which opened the 5300-foot Yegua pay on the east side, and also is south of the Stevenson 53 which opened the Cook Mountain sand to production.

Chambers County: Standard Oil Company of Texas and Salt Dome Oil Corporation have been making flow tests on the new discovery, State 1-21D, west

of South Anahauc field and in Trinity Bay. Perforations were made at 9093-98 feet and the flow was through 3/32-inch choke, making from 3 to 5 barrels of oil hourly on initial tests. Total depth is 9180 feet with 7-inch casing cemented on bottom of hole. The oil is coming from the Frio sand.

Wildcats: Humble Oil and Refining Company is preparing to drill another deep Wilcox well in the Warren area of Tyler County. The well is Goolsbee 1C on a 100-acre lease in J. B. Flieller survey, 2 miles northwest of Warren townsite. The location is 1 mile southeast of Humble's Goolsbee 1-B, 8424-foot dry hole abandoned in October, 1943.

Jack W. Frazier and Victor Praessel have projected a 5000-foot test near the town of Hempstead in Waller County. It is Hempstead Townsite Unit 1 on a 40-acre unit. Drilling is to begin at once.

Shell Oil Company is preparing to drill Stockton 1 on a 384-acre tract northwest of Louise townsite in Wharton County. Located in the G. Telfernor survey, the projected depth is 5900 feet with drilling to start at once.

Brazos County: J. Elmer Thomas of Fort Worth has abandoned Milo Heirs 1, wildcat in Millican area, at 4813 feet. The well, spotted in A. Millican survey about 2½ miles east-northeast of the townsite, found no commercial shows.

Galveston County: Phillips Petroleum Company is continuing its dual completion program in the League City field. The company's Rice Estate 3, lot 4, Perry & Austin survey, was perforated in top sand at 8695-8700 feet and flowed 136 barrels daily through ⅛-inch choke. The lower sand was perforated at 8960-64 feet and flowed 141 barrels daily through 3/16-inch choke.

North Louisiana

Bossier Parish Deep Test Waiting Orders

Carter Oil Company's S. H. Bolinger 1, deep wildcat test C SE NW 20-22n-11w, Bossier Parish, has reached contract depth of 9500 feet and has been shut down awaiting orders. No important shows were reported during the drilling operations and the test may be abandoned. However, definite future status of the well has not been announced.

Union Producing Company is completing the Penrod-Jordan 1, northwest of the northwest quarter 19-11n-10e, Tensas Parish, offset to the Holly Ridge discovery for the second producer in the new field.

Testing has not been completed but the well was reported to have flowed 260 barrels of oil in three hours and 50 minutes. Perforations were from 8382 to 8410 feet. Tubing pressure was reported at 1520 pounds and casing pressure 650 pounds.

Union Producing has made new location for the Penrod-Jordan 2, 660 feet south and 660 feet west of the northeast corner of section 19-11n-10e.

Sixteen new locations have been made for fields in a half dozen north Louisiana parishes with indications of increased drilling activities for the area which has suffered a slump for several months.

South Louisiana

Reddell Area Looms As Major Producing Zone

The Reddell area of Evangeline Parish is looming as a major production area with two wildcats now testing while a third is preparing to drill. Danciger Oil and Refining Company is testing in the ninth Wilcox section, but completion is due to be made in the Tate sand of the Sparta. The well is Haas 1 in section 22-4s-1w.

Continental Oil Company and Humble Oil & Refining Company are making flow tests in Pardee Lumber Company 3 in section 20-4s-1w, spotted 1½ miles west of the Danciger well. The Continental et al well was last perforated at 10,430-45 feet and flowed 53 barrels of 38-gravity oil in 13 hours through 10/64-inch choke. A drill-stem test was made at 10,358-70 feet and showed 7 stands of distillate. It is believed the well may be completed temporarily in a gas section to furnish fuel for Pardee Lumber 4 which already has been staked.

W. Dave Haas has announced location for Haas Estate 1 in section 18-4s-1w, between the Continental-Humble well and the Danciger test. Drilling is due to begin soon.

Calcasieu Parish: The first drilling in several months is promised for the Calcasieu Lake dome. Continental Oil Company has announced location for State-Calcasieu Lake 1, the well to drill to the deeper levels. This dome has been tested before but did not yield commercial production.

Development: Another excellent producer has been completed in the rapidly

8 Good Tips

on how to make brake lining last longer...

1. TRUE UP SCORED RIMS
before applying brake lining.

2. BE SURE WATER IS ON WATER-COOLED RIMS
before starting to run in drill pipe.

3. HAVE BRAKES EQUALIZED AT ALL TIMES

4. WHEN RELINING BANDS
be sure that brake bands are not out of round or kinked.

5. STONE OR SMOOTH UP
badly checked rims before applying lining.

6. REVERSE BANDS,
if live and anchored ends are interchangeable, when anchored end is half worn. This increases life more than 40%.

7. USE LINING IN SEGMENTAL FORM
Such action simplifies application, allows for release of worn particles and permits greater heat dissipation.

8. DO NOT USE OIL, CLAY
or other foreign materials to control friction. This causes gummed brake surfaces, early replacement of lining.

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expanding Vinton field of Calcasieu Parish where Union Oil Company of California's Gray 16-G flowed 198 barrels daily through ⅛-inch choke. Perforations were made at 5765-5800 feet, tubing pressure mounting to 1000 pounds, casing to 1050 pounds. This flank development is one of the most important in South Louisiana this year with a number of wells being completed in thick and prolific sands.

Beauregard Parish: More development is in line for the Mystic area where Sohio Production Company recently opened a new field. The second test is Lutcher-Moore Lumber Company in section 4-7s-12w. Brewster-Bartle Drilling Company is contractor for the Cockfield well.

The company opened production in the area with Lutcher-Moore 1, section 34-6s-12w, flowing 182 barrels of condensate daily through ¼-inch choke from perforations at 8014-20 feet. The well actually was drilled to 10,911 feet after topping Wilcox at 10,697 feet.

Petroleum Electric Power Group to Meet in Dallas

The annual meeting of the Petroleum Electric Power Association will be held December 1 and 2 at the Baker Hotel in Dallas, Texas.

The Association is comprised of over thirty utility electric power companies which serve the petroleum industry.

This year's meeting will be open only to the members of the Petroleum Electric Power Association and representatives of other utility electric power companies serving the petroleum industry.

Oklahoma

Trouble in Cleveland County Wildcat Being Overcome

The state's most watched wildcat test, Mid-Continent Petroleum Corporation's Harris 1, NE SE SW 29-10-3w, Cleveland County, near Moore, which lost hole after finding the second Wilcox sand saturated, has successfully regained the original hole. When the well was first drilled into the pay it was given only a brief and inconclusive test, and immediately developed trouble at 1400 feet with tools going off at a tangent into soft strata. During the weekend, however, the operator successfully bypassed the troublesome zone, circulated to bottom at 8792 feet, 12 feet into the sand, and conditioned the hole preparatory to running casing. After casing is run the operator plans on waiting 72 hours before going back into the well.

When the sand was originally drilled it was found to have been soft and porous, and well saturated. An incomplete drill-stem test indicated considerable pressure and ability to flow. Due to the test's proximity to other prolific Wilcox sand production, and to the fact that the Wilcox sand should be of considerable thickness in this geologic province, operators are considering the well a highly important test.

Oklahoma County: The most easterly drilling well in the West Edmond field, Sohio Producing Company's Young 1, C SW NE 32-14-4w, is drilling the main pay of the field. Hunton lime, after finding the formation 60 feet higher than nearest production to the west. While the well has not been tested to date, it apparently indicates another 40-acre extension to the east. Pipe was being run late in the week. In addition to this well and others active, the field has four new starts.

Grady County: The east edge of the Cement field is to be given a deep test at Skelly Oil Company's Goodwin 1, C SE NW 8-5n-8w, directly east of the field and not far from a deep gas well completed some years ago. Dry hole money is being contributed.

McClain County: Carter Oil Company's Cottingham 1, C SE SW 4-7n-3w, a deep test on the edge of the basin, is now below the 8000-foot marker and going deeper.

Washita County: Gulf Oil Corporation's Hopkins 1, C NW SE 8-8-20w, the deepest drilling well in the southwest area of the state is below 9900 feet. Earlier, this well found showing in granite wash.

Missouri

Forest City Basin Gets Second Well

Tarkio pool, the one-well strike in Missouri resulting from the Forest City Basin exploratory effort, is receiving its second well at Cities Service Oil Company's Cook 2, SE NW NW 32-65-39w, Atchison County. The new well, which topped the Bartlesville sand at 1362 feet, 10 feet higher than the pay was picked in the discovery, ran pipe to 1395 and perforated, 1365 to 1375 feet. When production was not as much as had been expected, the operator shot with eight quarts and it is estimated the well can complete for 60 barrels of low gravity crude daily on pump. The new well is a southeast diagonal offset to the discovery.

Carter Oil Company Buys Minnelusa's Holdings

It was anounced today by O. C. Schorp, president, The Carter Oil Company that effective November 10, 1943, the firm has purchased the stock of the Minnelusa Oil Corporation, with headquarters in Denver, Colorado.

Minnelusa Oil Corporation's holdings include properties in the Lance Creek field of Niobrara County, Wyoming, with daily average net production of 1,300 barrels and producing properties in the New Elk Basin pool of Park County, Wyoming, and Carbon County, Montana which have a net output of 2000 barrels a day. Among other holdings are included some 3400 acres of undeveloped leases in the Elk Basin area.

Carter Oil Company has been pursuing an active exploration program in the northwest area for the past several years, and at the present time maintains exploration headquarters at Billings, Montana. A subsidiary, the Santa Rita Oil and Gas Company operates 2000 barrels a day production in the Cut Bank field of northwestern Montana. The executive head of Minnelusa Oil Corporation, R. S. Shannon, will continue to actively prosecute the development of the properties involved in the sale.

It's Not America!

So the boys are back in the mines, ending the latest of four strikes which Ickes admits have cost the nation 40 million TONS of desperately needed coal. The miners get more money, John L. Lewis gets his pound of flesh on a government platter and John Q. Public pays the increased bill as inflation spirals merrily. We have no idea what all this is, but it isn't America. Not the America on which we founded this business 35 years ago when a man could join a labor union or not, as he chose; when if his wage or his job failed to suit him he found one that did; when every man rightly considered it his patriotic duty to keep politicians in line with outspoken criticism; when government tended to government and looked around for a way to pare expenses before imposing new taxes; when "social security" was bred of moral fiber instead of party politics; when TRY PELCO FIRST was a typical symbol of the freedom of unregimented private enterprise.

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United States Well Completions

ARKANSAS

Columbia County—Smart: G. H. Vaughn's Green 4, nw sw se 11-15n-20w, Tokio, td 2500 ft.

Vaughn's G. C. Buck 2, nw sw nw 12-15-20w, abnd.

Columbia County—Haynesville: Navarro Oil Co.'s Waller 1, nw sw sw 9-20s-20w, Pettit.

Nevada County—Smart: McAleser's J. R. Williams A-2, nw se se 2-15s-20w, abnd 2500 ft.

ARKANSAS WILDCATS

Calhoun County—Failure: Lion Oil & Refining Co.'s Anthony 1, nw nw nw 13-13s-16w, abnd 3097 ft.

Union County—Failure: Alice-Sidney's Cutrer 1, nw sw 16-17s-14w, abnd 4000 ft.

CALIFORNIA

Fresno County—Coalinga: Standard's 6-25A, sw nw sw 25-19-15, pump 82 bbls 30-gr, 6⅝-in 3939 ft, td 3981 ft, pb 3943 ft.

Westates Petroleum Corp.'s Commercial 19, ne ne ne 31-19-15, 57 ft perf 1821 ft, td 1843 ft, pb 1821 ft.

Kern County—Belridge, South: Belridge Oil Co.'s 63A-34, ne sw ne 34-28-21, pump 45 bbls 12.5-gr oil, 30 water, perf 1014-1300 ft, td 1300 ft.

Belridge Oil Co.'s 64-34, se sw ne 34-28-21, pump 15 bbls 11.6-gr oil, 85 water, perf 144-1300 ft, td 1300 ft.

Belridge Oil Co.'s 64A-34, ne nw sw 34-28-21, pump 65 bbls, td 1200 ft.

General Petroleum Corp.'s 30-2, nw nw ne 2-29-21, pump 78 bbls 14-gr oil, 8 water, perf 590-710, 868-935, 998-1085 ft, td 1090 ft.

Shell's FKL 9-1, se se sw 1-29-21, pump 55 bbls oil, 36 water, perf 1126-1167, 1083-1075, 1044-888 ft, td 1186 ft, pb 1135 ft.

Shell's TWA 6, nw se sw 1-29-21, 160 ft perf 1072 ft, td 1085 ft.

Kern County—Cymric: Honolulu Oil Corp.'s 8-25, sw sw sw 25-29-21, 118 ft perf 1303 ft, top oil sand 1188 ft, td 1450 ft, pb 1310 ft.

Victory Oil Co.'s 63-A, ne sw ne 26-29-21, perf 1108-1128, 1145-1180 ft, oil sand 1060-1070, 1147-1190 ft, td 1265 ft, pb 1180 ft.

Kern County—Fruitvale: Mohawk Petroleum Co.'s 7, se sw nw 27-29-27, pump wash oil, perf 3746-65, 3840-60, 3897-3912, 3915-45, 3950-55, 4062-82, 4095-4125, 4155-60 ft, td 4367 ft.

Kern County—Mount Poso: General Petroleum Corp.'s Glide 21-22, sw nw ne, 21-27-28, pump 244 bbls 15.5-gr oil, 35 water, 52 ft perf 1827 ft, td 1827 ft.

Kern County — Poso Creek: Grandell Oil Co.'s Kihorny Claflin 5, sw se se 10-27-27, pump 50 bbls, 58 ft perf 1284 ft, td 1284 ft.

Kern County—Poso Creek-Premier: Standard's 5-30, se se ne 5-28-27, pump 105 bbls 12.5-gr oil, 15 water, 122 ft perf 2702 ft, td 2704 ft.

Los Angeles County—Coyote, West: Standard's Emery 74, ne se se 13-3-10, pump 126 bbls 30.5-gr oil, 10 water, 476 ft perf 5793 ft, td 5796 ft.

Los Angeles County—Torrance: St. Francis Oil Co.'s Spencer Comm. 1, 2300 ft s 300 e c/ls Huntington and Victor, 110 bbls circulated and formation oil, perf 3638-3315, 3211-3150 ft, td 3655 ft.

Harold C. Morton's Carson 15, 215 ft s 410 ft w fr nwc intersec Henrietta and Huntington Sts., pump est 100 bbls, perf 3010-85, 3198-3545 ft, td 3560 ft.

Los Angeles County—Wilmington: Cleveland Oil Co.'s Ronan 1, 396 ft s 138 ft w c/ls Sandison and McDonald Aves., pump est 35 bbls oil, 140 water, 493 ft perf 3715 ft, td 3715 ft.

Union Pacific's 199, 7410 ft s 3205 ft e c/ls Ford and Anaheim, flow 521 bbls 21.7-gr, perf 2229-31, 2250-2307, 2327-2520, 2590-2815 ft, td 2815 ft.

Orange County—Huntington Beach: Standard's A-53, 330 ft nwly along c/l Wesley Ave. fr c/l 23rd St. thence 330 ft at r/a, pump 16 bbls oil, 22 water, 436 ft perf 3664 ft, td 366 ft.

Orange County—Newport Beach: Signal Oil & Gas Co.'s Banning 2, 609 ft n 266 ft e nwc Tr. 772, 20-6-10, pump est 12 bbls oil, 8 water, 87 ft perf 1710 ft, td 3779 ft, pb 1720 ft.

Santa Barbara County—Cat Canyon (old well deepened): Standard's 5-30, nw ne sw 27-9-33, pump 450 bbls 13.4-gr, otd 6144 ft, td 6295 ft.

Santa Barbara County—Gato Ridge: Barnsdall's Tognazzini 5, ne nw nw 15-8-32, pump all circulated oil, perf 1789-2641, 2681-2952, 2990-3266, 3300-3441 ft, Monterey 1759 ft, td 3444 ft.

Ventura County—Ventura Avenue: Tide Water's Hartman 29, 1272 ft n 4880 ft e c/l No. 11, flow 971 bbls 29.8-gr oil, 517,000 gas, 1-in, 100/930 lbs, 634 ft perf 11,735 ft, td 11,740 ft.

CALIFORNIA WILDCATS

Kern County—Discovery: Richfield's Tejon 5, nw nw se 35-11-19, Tejon Ranch area, pump 192 bbls 18.2-gr, 194 ft perf 2370 ft, producing from Chanac sand, td 2372 ft.

Tulare County — Failure: Richfield's Terra Bella-Adams 1, nw se nw 29-22-27, Terra Bella area, gray sand, abnd 1920 ft.

ILLINOIS

Clay County: W. C. McBride's L. Woolridge 1, se ne sw 22-5n-5e, A V 2365-71 ft, 22 bbls, td 2531 ft.

Gallatin County: Cherry & Kidd's F. J. Wright 2, se ne ne 15-8s-10e, hard sd 2136-52 ft, Cyp sd 2368-96 ft, 200 bbls, td 2396 ft.

Hamilton County: Texas Co.'s Drew Comm. 2, sw ne nw 20-4s-7e, A V 3287-3303 ft, Rosi 3367-74 ft, 428 bbls, 3375 ft.

Nat'l Assoc. Pet. Co.'s Rebstock 1-A (DD) sw sw nw 26-4s-7e, A V 3304-11 ft, otd 3304 ft, 659 bbls, 3311 ft.

Nat'l Assoc. Pet. Co.'s York-Tibbs 1, ne nw nw 35-4s-7e, A V 3303-13 ft, 600 bbls, 3314 ft.

Shell's G. W. Morris 5, ne nw se 18-6s-7e, Tar Spgs 2373-2401 ft, 724 bbls, 2416 ft.

Texas Co.'s M. Sterks 2, sw se sw 18-6s-7e, Tar Spgs 2444-50 ft, 133 bbls, 2466 ft.

J. J. Broadus et al's R. T. Vineyard 2, ne sw nw 19-6s-7e, abnd 2800 ft.

Jackson County: Wiser Oil Co.'s Jackson Co. Coal 2, s½ sw sw 22-7s-1w, abnd 2332 ft.

Madison County: Eason Co. et al's Pence 1, se ne ne 16-4n-6w, Devonian 1757-67 ft, 168 bbls, 1772 ft.

Marion County: Gulf's John Blankenship 1, se sw nw 25-1n-3e, L. O'H 2695-2705 ft, McCl 2740-37 ft, 66 bbls, 2741 ft.

Magnolia's Edna White 1, sw ne 25-1n-3e, abnd 2830 ft.

Texas Co.'s C. Peters 1, nw nw nw 34-2n-2e, Ben 1840-49 ft, 20 bbls, 2150 ft.

Adams Oil & Gas Co.'s Adams 3, sw ne sw 29-4n-1e, Ben 1420-42 ft, 75 bbls, 1590 ft.

Adams Oil & Gas Co.'s Adams 4, ne sw sw 29-4n-1e, abnd 1583 ft.

Shelby County: E. J. Bergendthal et al's Scheff Heirs 1, ne ne se 21-10n-5e, abnd 1991 ft.

Wabash County: Magnolia's Campbell Heirs 2, ne se ne 7-1s-12w, Cyp sd 2012-20 ft, 2,500,000 gas, td 2020 ft.

Texas Co.'s W. Geiger 2, se se se 8-1s-12w, Weiler 1992-97 ft, 1999-2007 ft, 32 bbls, 2009 ft.

Texas Co.'s W. P. Steckler 4, se nw se 8-1s-12w, Weiler 2019-30 ft, 35 bbls, 2031 ft.

Superior's E. & C. Crown Unit 7, nw nw nw 9-1s-12w, Cyp 2029-35 ft, 25 bbls, 2382 ft.

Superior's E. A. Viehman 9, se sw nw sw 9-1s-12w, Cyp 2031-41 ft, 30 bbls, 2044 ft.

Wabash Oil Co.'s Steckler 1, ne se nw 16-1s-12w, Cyp 1995-2008 ft, 125 bbls, 2328 ft.

Gulf's Fieber 1, sw sw sw 20-2s-14w, abnd 2196 ft.

First Nat'l Pet. Trust's C. C. Clifford 1, e½ nw se 20-3s-14w, Biehl 1890-1904 ft, 1908-22 ft, Cyp 2777-2788 ft, 31 bbls, 2801 ft.

Washington County: E. Frank Jones' W. A. White 1-D, ne sw 2-2n-2w, abnd 2009 ft.

Wayne County: Texas Co.'s W. Jones 1, sw ne sw 9-1s-6e, A V 3038-49 ft, 232 bbls, 3051 ft.

Cities Service's Vaught 1 (DD), w½ sw nw 33-2s-9e, McCl 3317-29 ft, otd 3303 ft, 648 bbls, td 3329 ft.

Pure's Keyser Cons. 2, sw se 14-1n-8e, McCl 3070-77 ft, 3080-86 ft, 425 bbls, 3175 ft.

Pure's L. P. Gray "A" 1, nw nw se 34-2n-7e, A V 2983-95 ft, 125 bbls, 2998 ft.

J. P. Washburn et al's L. C. Jordan 1, se se nw 34-2n-7e, A V 2961-68 ft, 230 bbls, 2979 ft.

White County: N. V. Duncan's B. Metcalf 6, se nw se 31-3s-14w, Penn 1564-90 ft, 135 bbls, 1592 ft.

Skelly's R. Glover 2, nw sw sw 12-3s-10e, abnd 2037 ft.

F. Metcalf & Sam Malias' Smith 1, sw se se 16-4s-14w, abnd 2851 ft.

Clint Crosby's Bennett 1, nw nw sw 6-5s-11e, Tar Spgs 2248-59 ft, 2285-94 ft, 2298-2310 ft, 8 bbls, td 2310 ft.

Carter Oil Co.'s Urban Holmes 1, se se nw 19-6s-9e, U Tar Spgs 2371-90 ft, 23 bbls, 3117 ft.

Minerva Oil Co.'s Ackerman 1, ne se se 33-6s-10e, abnd 3045 ft.

ILLINOIS WILDCATS

Jasper County — Failure: Helmerich & Payne's Raymond Hines 1, sw sw se 3-5n-10e, abnd 2980 ft.

Jefferson County—Discovery: Bell Bros.' Indiana Nat'l Bank 1, e½ ne ne 24-1s-3e, McCl 2778-82 ft, 2860-69 ft, 264 bbls, td 2881 ft.

Monroe County—Discovery: Chas. McLaughlin's Hirsch 1, ne nw se 11-2s-10w, Trenton 455-481 ft, 17 bbls, 491 ft.

White County—Failure: Gulf's M. C. Connery 1, se se nw 1-5s-8e, abnd 3350 ft.

Wells Completed in United States in Week Ended November 13, 1943

Data preliminary and subject to revision. Revised and more complete data on all completions shown in monthly summary of drilling, published in second issue of each month. More detailed data on wildcats published in third issue of each month.

State or District	FIELD COMPLETIONS: New Wells *Oil	Gas	†Input	Dry	Total	Old Wells Deepened	WILDCAT COMPLETIONS *Oil	Gas	Dry	Total	ALL COMPLETIONS: This Week	Last Week	Cumulative: This Year	Last Year
Alabama	....	....	....	....	....	....	....	..	....	....	....	....	2	3
Arizona	....	....	....	....	....	....	....	..	....	....	....	1	5	2
Arkansas	2	....	....	2	4	....	....	..	2	2	6	10	190	203
California	23	....	....	....	23	1	1	..	1	2	26	34	1,389	678
Colorado	....	....	....	....	....	....	....	..	....	....	....	2	24	14
Florida	....	....	....	....	....	....	....	..	....	....	....	....	1	.....
Georgia	....	....	....	....	....	....	....	..	....	....	....	....	1	2
[1]Illinois	50	1	....	20	71	4	4	..	11	15	90	....	1,612	1,913
Indiana	5	....	....	1	6	....	....	..	2	2	8	3	244	343
Kansas	19	2	....	7	28	2	....	..	....	....	30	50	1,515	1,433
[1]Kentucky	7	....	....	3	10	....	2	..	4	6	16	6	363	147
Louisiana	11	....	....	2	13	....	....	..	....	....	13	11	503	832
North Louisiana	4	....	....	....	4	....	....	..	....	....	4	....	196	.....
South Louisiana	7	....	....	2	9	....	....	..	....	....	9	11	307	.....
Michigan	3	1	....	2	6	....	....	..	2	2	8	19	521	611
Mississippi	....	....	....	....	....	....	....	..	....	....	....	....	35	96
Missouri	....	....	....	....	....	....	....	..	....	....	....	....	22	33
Montana	2	....	....	6	8	....	....	..	3	3	11	19	208	181
Nebraska	....	....	....	....	....	....	....	..	....	....	....	....	....	28
New Mexico	3	....	....	1	4	....	....	..	....	....	4	4	235	349
New York	19	....	8	....	27	....	....	..	....	....	27	26	1,046	1,079
Ohio	6	2	....	2	10	....	....	..	....	....	10	8	699	986
Oklahoma	47	....	1	6	24	3	1	..	5	6	33	36	1,264	1,256
Pennsylvania	34	....	16	....	50	....	....	..	....	....	50	49	2,370	3,481
Tennessee	....	....	....	....	....	....	....	..	....	....	....	....	6	8
Texas	52	1	....	20	73	5	3	..	14	17	95	115	3,707	4,767
E. T. Bor. Co.'s	....	....	....	....	....	....	....	..	....	....	....	....	16	.....
East Texas Field	....	....	....	....	....	....	....	..	....	....	....	....	5	.....
Rest of E. Texas	4	....	....	1	5	....	....	..	2	2	7	8	212	.....
North Texas	11	....	....	5	16	....	1	..	1	2	18	33	917	.....
W. Central Texas	2	....	....	....	2	1	....	..	4	4	7	11	335	.....
West Texas	21	....	....	5	26	4	....	..	1	1	31	28	833	.....
Texas Panhandle	1	1	....	....	2	....	....	..	....	....	2	6	171	.....
Gulf Coast, Upper	5	....	....	3	8	....	....	..	3	3	11	9	287	.....
Gulf Coast, Lower	7	....	....	3	10	....	2	..	1	3	13	13	556	.....
Southwest Texas	1	....	....	3	4	....	....	..	....	....	4	7	321	.....
S. Central Texas	....	....	....	....	....	....	....	..	2	2	2	....	54	.....
West Virginia	1	15	....	4	20	....	....	..	....	....	20	14	602	658
Wyoming	7	....	....	1	8	....	....	..	....	....	8	....	111	88
Total U.S.	261	22	25	77	385	15	11	..	44	55	455	407	16,675	19,19

* Includes distillate wells. † Includes salt water disposal wells. [1] Two weeks, ending Nov. 13, 1943.

ILLINOIS

Clay County: Texas Co.'s J. S. Louden 1, sw se ne 22-5n-5e, A V 2342-55 ft, 124 bbls, 2358 ft.

Edwards County: Superior's A. C. Wick 1, nw se ne 25-2s-10e, abnd 3211 ft.

Illinois Products Corp.'s Albert Gaede "B" 1, e½ ne ne 9-1n-10e, McCl 3268-77 ft, 577 bbls, 3277 ft.

Ryan & Fortner's Gaede 1, nw sw nw 10-1n-10e, abnd 3295 ft.

Effingham County: Bell Bros.' H. E. Bushue 1, c ne se 17-6n-6e, abnd 2610 ft.

Gallatin County: (Old well deepened) Carter Oil Co.'s E. H. Busick 4, sw sw se 11-8s-10e, Cyp sd 2377-2400 ft, otd 2054 ft, 54 bbls, td 2400 ft.

Hamilton County: Magnolia's E. Peters 1, sw se sw 26-4s-7e, A V 3303-06 ft, 66 bbls, 3306 ft.

Kingwood Oil Co.'s Shelton 1, sw sw ne 18-6s-7e, Tar Spgs 2380-95 ft, 165 bbls, 2418 ft.

Shell's G. W. Morris 6, sw nw se 18-6s-7e, Tar Spgs 2374-78 ft, 2386-2408 ft, 396 bbls, td 2417 ft.

Texas Co.'s J. C. Hall "B" 12, sw ne se 18-6s-7e, Tar Spgs 2375-2408 ft, 208 bbls, 2420 ft.

Texas Co.'s J. C. Hall "B" 13, ne ne se 18-6s-7e, Tar Spgs 2377-94 ft, 110 bbls, 2394 ft.

Jasper County: Gulf's M. Heap 1, se ne sw 28-6n-9e, McCl 3108-16 ft, 515 bbls, 3129 ft.

Magnolia's O. Kincade 1, sw se 28-6n-9e, McCl 3106-11, 3122-25 ft, 180 bbls, 3162 ft.

Jefferson County: Geo. Allison et al's Jefferson O. & G. Co. 1, ne ne ne 32-3s-2e, abnd 2532 ft.

Magnolia's Daniels Unit 1, sw sw sw 8-3s-3e, A V 2672-84 ft, 47 bbls, 2684 ft.

Lawrence County: Clark C. Nye's H. Clark 2, se ne se 3-2n-12w, Penn 600-21 ft, 20 bbls, 995 ft.

Madison County: Oberling & Bryan's B. Ellis 1, sw ne ne 27-3n-6w, Trent 2356-73 ft, 50 bbls, 2373 ft.

Marion County: Texas Co.'s E. S. Snyder 8, ne nw ne 16-1n-2e, Ben 1885-92 ft, 85 bbls, 1895 ft.

Richland County: James L. Black's A. N. Hunt 1, se nw 10-3n-9e, Weiler 2582-91 ft, 75 bbls, 2591 ft.

Pure's C. M. Hout 1, c s½ sw, 30-3n-9e, McCl 2973-75 ft, 138 bbls, 3075 ft.

Wabash County: C. E. Skiles' Smalley Heirs 1, sw se ne 3-1s-13w, Biehl 1723-41 ft, Weiler 2298-2304 ft, 260 bbls, 2316 ft.

Geo. & Wrather's Zimmerman 2, sw se sw 4-1s-12w, Cyp 2009-22 ft, Biehl 1470-81 ft, 80 bbls, 2024 ft.

Dean & Morton's H. Baumgart 1, ne se sw 5-1s-12w, Cyp 1983-91 ft, 156 bbls, 2000 ft.

Texas Co.'s C. Kuhn 3, sw nw sw 8-1s-12w, Weiler 2046-50 ft, 1100 bbls, 2060 ft.

Geo. & Wrather's Zimmerman 1, ne ne nw 9-1s-12w, Biehl 1473-97 ft, Cyp 2017-32 ft, 110 bbls, 2035 ft.

Superior's E. & C. Crowe Unit 5, se nw nw 9-1s-12w, Biehl 1473-1518 ft, 100 bbls, 2178 ft.

Superior's E. A. Viehman 8, ne nw sw 9-1s-12w, Biehl 1498-1507 ft, 1512-28 ft, 25 bbls, 2180 ft.

W. E. Ballor's Beamon 1 (DD), sw se 27-1n-13w, otd 2659 ft, abnd 2696 ft.

Washington County: Chicago Pet. Corp.'s L. Pinski 1, ne ne sw 23-3s-3w, Ben 1241-61 ft, 10 bbls, 1261 ft.

Wayne County: Bell Bros.' Vaughn 1, se nw sw 32-2s-9e, abnd 3410 ft.

Cities Service's Boggs "B" 1, w½ nw sw 33-2s-9e, McCl 3287-94 ft, 3314-28 ft, 734 bbls, 3365 ft.

Texas Co.'s Geo. Stone 3, ne ne sw 9-3s-7e, A V 3196-3262 ft, L O'H 3290-96 ft, McCl 3351-56, 49 bbls, 3360 ft.

Wiser Oil Co.'s T. E. Hilliard 1 (WO), s½ se sw 23-1n-6e, A V 3025-37 ft, 70 bbls, 3192 ft.

United Prod. Co.'s H. E. Matchett 2 (WO), n½ sw se 27-1n-6e, A V and McCl 2918-46 ft, 18 bbls, 3086 ft.

Pure's M. Fitch 2, sw nw ne 14-1n-8e, abnd 3215 ft.

Pure's P. Plow 1, nw sw ne 34-2n-7e, abnd 3140 ft.

Pure's Geo. Hearn 1, se nw sw 35-2n-7e, abnd 3090 ft.

White County: (Old well deepened) Pure's E. A. Pyle "B" 1, nw sw sw 17-6s-9e, Ben 2787-2805 ft, otd 2800 ft, 27 bbls, deepened 2942 ft, pb 2805 ft.

Smokey Oil Co.'s Sandy Run Lake Club 1, se sw se 7-7s-8e, abnd 3253 ft.

ILLINOIS WILDCATS

Clark County—Failure: Walter Vette's Hunt 1, se sw sw 25-9n-8w, abnd 530 ft.

Crawford County—Failure: Bell Bros.' Hill Heirs 21, se se ne 23-8n-13w, abnd 995 ft.

Edwards County—Discovery: Superior's Earhart 1, nw se se 25-2s-10e, Walts sd 2415-20 ft, McCl 3179-83 ft, 152 bbls, td 3233 ft.

Franklin County—Failure: E. S. Dakins' Cambon-C. W. & F. Coal Co. 1, nw nw sw 16-7s-2e, abnd 2843 ft.

Jefferson County—Failures: L. R. Thompson's R. Copple 1, nw sw ne 7-1s-2e, abnd 1775 ft.

Lario O. & G.'s Russell 1, ne ne nw 33-2s-4e, abnd 3255 ft.

Lawrence County—Failure: R. L. Bauman et al's Corrie 1, 22-2n-13w, abnd 2908 ft.

Marion County—Failure: Nat'l Assoc. Pet. Co.'s W. S. Carter 1, sw nw sw 9-3n-4e, abnd 2562 ft.

St. Clair County—Failure: (Old well deepened) Williams & Johnson's W. A. Winter 1, se nw nw 13-3s-7w, otd 1710, abnd 2150 ft.

Wayne County—Failure: Gulf's Boggs 1, sw sw sw 36-2s-6e, abnd 3460 ft.

White County—Discovery: Smokey Oil Co.'s Delap 1, se sw ne 8-7s-8e, McCl 3080-83 ft, 14 bbls, 3086 ft.

INDIANA

Gibson County: Geo. & Rather's Wilson 1, nw nw nw, Don 142-1s-12w, McCl 2325-29 ft, 65 bbls, 2339 ft.

Superior's Hall Brazelton 1, se ne nw 25-2s-12w, Cyp 1985-98 ft, 211 bbls, 2134 ft.

Speak & Arnn's Virgil McCarty 1-A, sw se nw 13-2s-11w, McCl 2054-60 ft, 20 bbls, 2143 ft.

Posey County: Jarvis & Marcell's Sanders 2, sw ne sw 26-6s-13w, abnd 2849 ft.

Spencer County: Dewey Stinson's S. B. Hall 1-A, sw sw sw 29-7s-6w, Pal 944-54 ft, 20 bbls, 954 ft.

Vanderburg County: Superior's R. A. Numerburn 5, ne ne se 31-6s-11w, McCl 2542-47 ft, 61 bbls, 2651 ft.

INDIANA WILDCATS

Vanderburg County: Clarck Nye's H. L. Hahn 1, se sw se 18-7s-11w, abnd 2592 ft.

Warrick County: Mo-Bu-Stro's Rebber 1, nw se se 3-4s-6w, abnd 1261 ft.

KANSAS

Cowley County—Un-named: Northern Ordnance's Cunningham 1, sw se ne 19-33s-8e, K. C. 2403, 3000 gals acid, pump 8 bbls oil, td 2437 ft.

Cowley County—Rahn: B. B. Blair et al's M. Waldschmidt 2, se ne se 12-34s-5e, B'ville 2864 ft, flow 464 bbls, 2911 ft.

Cowley County: Blair & McMahon's Thompson 1, se sw nw 7-34s-6e, B'ville 2877 ft, flow 349 bbls, 2899 ft.

Edwards County—Belpre: Cities Service's Breitenbach 1, c e½ se se 5-25s-16w, Lansing 3776 ft, 4500 gals acid, flow 32 bbls oil, 800,000 gas, td 4480 ft.

Ellis County—Un-named: Coralena's Sarah Foster 1, ne se ne 34-15s-16w, Lansing 3145 ft, 2000 gals caid, pump 1249 bbls, 3204½ ft.

Ellis County—Ruder: B&R Drlg.'s Wolf 1, sw nw nw 16-15s-18w, Arbuckle 3591 ft, 3000 gals acid, hfw, abnd 3609 ft.

Ellsworth County—Stoltenberg: I. W. Murfin's Loulax 3, c s½ sw se 28-16s-10w, Arbuckle 3284 ft, pump 300 bbls oil, 10 wtr, 3298 ft.

Ellsworth County—Wilkens: Lauck & Moncrief's Frevert 1, c n½ ne sw 11-17s-10w, Arbuckle 3218-22 ft, 2000 gals acid, shot 25 qts, pump 269 bbls, 3269 ft.

Greenwood County — Beaumont: K. T. Weideman's Lewis "A" 20, se nw sw 25-27s-8e, Peru sand 1830 ft, pb 1875 ft, shot 200 qts, pump 25 bbls oil, 1½ bbls wtr, 2759 ft.

Kearny County — Hugoton Gas: Finker's Hamlin 4, c sec 36-24s-35w, Ft. Riley prod. 20,000 gals acid, 22,500,000 gas, 2694 ft.

Marion County—Robinson: Frank Dieter's Sievert 1, ne ne se 16-20s-5e, K. C. 1690 ft, hfw, abnd 2157 ft.

McPherson County—Roxbury: Phillips' Hayden 1, c s½ nw ne 29-17s-1w, Miss 2643 ft, hfw, abnd 2687 ft.

McPherson County—Lindsborg: Bay Pet.'s Heart 1, nw se sw 36-17s-4w, Misener 3383 ft, Viola 3398 ft, perf 1000 gals acid, pump 19 bbls oil, td 3405 ft.

McPherson County—Ritz-Canton: J. H. Johnson's Dan Koehn 1, ne ne ne 16-19s-2w, Chat 2930 ft, 2000 gals acid, pump 140 bbls, 2944 ft.

Phillips County—Ray: A. G. Hanson's Fee 2, sw sw se 21-5s-20w, Arbuckle 3652 ft, abnd 3660 ft.

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Phillips County—Hansen: Cities Service's Hansen "C" 2, sw ne nw 25-5s-20w, Arbuckle 3522 ft, pump 418 bbls, 3635 ft.

Pratt County—Cunningham: Skelly et al's Bowers 1, c e½ ne ne 3-28s-11w, Lansing 3496 ft, 5000 gals acid, pump 150 bbls oil, 5 bbls wtr, 3549 ft.

Pratt County—Chitwood: Lion Oil & Ref.'s Chitwood 5, ne ne sw 23-28s-12w, Simpson Sandy dolomite 4385 ft, 500 gals acid, flow 6.7 bbls per hr for 3 hrs, ¼-in, td 4455 ft.

Rice County—Chase: D. R. M.'s Grizzell "G" 1, sw nw nw 9-19s-9w, Arbuckle 3239 ft, 300 gals acid, pump 54 bbls oil, 124 bbls wtr, 3320 ft.

Rush County—Otis-Albert: Ohio's J. C. Brack 3, c nw sw 24-18s-16w, Reagan 3483 ft, Pre-Cambrian Schist 3536 ft, 7-in at 3529 ft, pump 107 bbls, 3547 ft.

Russell County — Williamson: Coralena's Krug 4, sw nw se 4-14s-14w, K. C. 3013 ft, 2000 gals acid, pump 170 bbls, 3043 ft.

Russell County: Coralena's Krug 1, sw ne se 9-14s-14w, Lansing 3018 ft, 2000 gals acid, 1000 gals acid, pump 158 bbls, 3040 ft.

A. H. Witt's Furthmeyer 3, c e½ nw se 9-14s-15w, Lansing 2999 ft, 3000 gals acid, pump 392 bbls, 3000 ft.

Russell County—Trapp: R. H. Shields' Gross "A" 3, c s½ se se 5-15s-13w, Lansing 2983 ft, pay 3018-25 ft, 5000 gals acid, pump 315 bbls, 3030 ft.

Skelly's Anderson 3, se sw ne 7-15s-13w, Lansing 3012 ft, top pay 3036 ft, 5000 gals acid, pump 52 bbls oil in 5 hrs, pump 257 bbls oil, 3% wtr, 3084 ft.

Russell County—Sellens: Transwestern's Berrick 1, sw sw nw 23-15s-13w, Arbuckle 3297 ft, 3500 gals acid, abnd 3328 ft.

Stafford County—Gates: Magnolia's R. C. Gates 4, c sw ne 35-21s-13w, Arbuckle 3797 ft, abnd 3807 ft.

Stafford County—Drach: Stanolind's Krankenburg 3, c se sw 6-22s-12w, Lansing 3323 ft, Arbuckle 3712 ft, pb 3501 ft, 1000 gals acid, abnd 3734½ ft.

KANSAS OLD WELLS DEEPENED

Russell County—Gorham: Cities Service's Crawford "A" 1, ne ne sw 2-14s-15w, otd 3108 ft, Fordham 3304 ft, pump 114 bbls oil, 486 bbls wtr, td 3306 ft.

Stafford County: Phillips' Hitz 3, c nw nw 7-22s-12w, otd 3670 ft, Arbuckle 3666 ft, 1500 gals acid, td 3674 ft.

KENTUCKY

Butler County: W. H. Schuler et al's G. Gaston 1, 12-H-32, abnd 600 ft.

Daviess County: J. E. Ellis' A. C. Baird 2, 15-N-29, abnd 1465 ft.

Henderson County: Burbank's Water Well 1-A, sw sw nw 9-P-21, abnd 392 ft.

Henderson County: Iley Browning's Strum 3, 3-n-23, Tar Spgs 1932-43 ft, 64 bbls, td 1943 ft.

Gulf's Moorehead 8, 23-Q-21; Cyp 2292-2313 ft, 302 bbls, 2313 ft.

Ohio County: Tom Galey & Ashland's J. T. Hoover 1 (12), 13-M-31, McCl 1226-43 ft, 1245-2149 ft, 27 bbls, 1251 ft.

Galey & Vickers' Wedding 17, 13-M-33, Tar Spgs 308-24 ft, 7 bbls, 333 ft.

Union County: Hiawatha's City of Uniontown 2, 20-P-19, Tar Spgs 1835-43 ft, 100 bbls, 1843 ft.

Union County: Sun Oil Co.'s Tapp 4, 10-O-20, O'H 2509-11, McCl 2539-46 ft, 303 bbls, 2551 ft.

Webster County: Shamrock Oil Co.'s H. Z. Clarck 2, 23-M-21, Mans 1174-96 ft, 60 bbls, 1225 ft.

KENTUCKY WILDCATS

Allatin County — Failure: Gulf's Carnegie Tech 3, sw nw sw 11-V-74, abnd 1155 ft.

Allatin County — Failure: Gulf's Carnegie Tech 2, 24-V-74, 944 ft, abnd.

Henderson County—Failure: C. D. Burbank's Fee 2, 9-P-21, abnd 2874 ft.

Henderson County—Failures: Carter Oil Co.'s Roscoe Sellers 1, 6-O-23, 2726 ft, abnd.

Kingwood's White 2, 11-P-24, 495 ft, abnd.

H. P. Maier's Bauldauf 1, 6-Q-24, 2516 ft, abnd.

McLean County — Failure: Kingwood's A. Wittmer 1, 6-K-28, 2558 ft, abnd.

McLean County—Failure: Sohio & Daley's Lulu Cox 1, 17-M-30, abnd 1210 ft.

Ohio County—Discovery: J. Anton & Holman's J. Handley 1, 17-M-32, Tar Spgs 508-53 ft, 5 bbls, 594 ft.

Union County—Discovery: M. P. Evans et al's Bessie Ballswell 1, 14-O-18; AV 3726-43 ft, 127 bbls, 2854 ft.

Union County—Failure: Kingwood Coaster et al's Haas Comm 1, 24-P-20, abnd 2693 ft.

Ohio County—Failure: Sohio & Hune's T. E. Bidwell 1, 12-L-29, 2005 ft, abnd.

NORTH LOUISIANA

Caddo Parish — Pine Island: Kennedy and Bacheller's Muslow C-4, nw nw nw 5-20n-15w, td 1500 ft.

Davis and Hart's Muslow A-11, se sw ne 5-20n-15w, td 1500 ft.

Davis and Hart's Muslow A-15, nw sw ne 5-20n-15w, td 1500 ft.

Davis and Hart's Muslow A-16, td 1500 ft.

SOUTH LOUISIANA

Beauregard Parish: Phillips' W. B. Cooley 1, 522 ft fr s 618 ft fr el 21-6s-9w, perf 6541-45 ft, pump 230 bbls 42.5-gr, 5/32-in, td 6620 ft.

Calcasieu Parish—Vinton: Union Oil Co.'s Gray et al 16, 203 ft n 865 ft w of se cor 28-10s-12w, perf 5765-5800 ft, pump 198 bbls 35-gr, ⅛-in, td 5850 ft.

Cameron Parish—Chalkley: Grubb & Hawkins' Sweetlake Land & Oil Co. 2, c nw¼ 6-12s-6w, abnd 8305 ft.

Iberia Parish—Avery Island: Humble's Petit Anse Co. 7, 4212 ft n 821 ft w of sec 26-13s-5e, perf 8940-65 ft, pump 298 bbls 33.2-gr oil, 10/64-in, td 8977 ft, pb 8968 ft.

Lafourche Parish—Chacahoula: Sun's Dibert, Stark & Brown 19, 2719 ft w 2224 ft n of sec 70-15s-15e, perf 4235-45 ft, pump 103 bbls 29.9-gr, 10-64-in, td 5199 ft, pb 4270 ft.

Lafourche Parish—Delta Farms: California Co.'s Vail 2, begin se cor sec 36 go w 1967 ft n 1 deg w 552 ft 36-16s-22e, perf 9011-50 ft, pump 240 bbls 34.1-gr, 9/64-in, td 9060 ft.

Lafourche Parish—Valentine: Pan American's Citizens Bank & Tr. Co. 1, 4370 ft s 13 deg 16 m w fr nw cor sec 102 sw ra 102-17s-20e, abnd 10,357 ft.

St. Mary Parish—Bayou Sale: Humble's Canal Bank & Tr. Co. 5, start ne cor sec 16 go 3420 ft sw'ly nwl th ra 3990 ft se'ly 16-16s-9e, perf 10,382-97 ft, pump 303 bbls 36.1-gr oil, 1% wtr, 5/32-in, td 7292, ft pb and st 2451 ft, td st hole 10, 298 ft.

Terrebonne Parish—Caillou Island: Texas Co.'s State-Caillou Island 73, lse 188, n 72 deg 23 m e 15,270 ft fr USCGS in Timbalier Bay, perf 11,160-65 ft, 11,144-156 ft, flow 280 bbls 35.2-gr, ⅛-in, td 11,289 ft.

MICHIGAN

Allegan County—Dorr: Sprenger Bros.' Ballicki 1, sw ne nw 29-4n-12w, Monroe, dry, td 2981 ft.

Arenac County—Deep River: Arenac Oil &

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Gas Co.'s Netzlaff 1, se nw nw 18-19n-4e, Berea sand, dry, td 1568 ft.

Mecosta County: Gulf's Jenks 1, s½ ne nw 7-16n-7w, Dundee lime, flow 101 bbls, td 3862 ft.

Osceola County — Rose Lake: Smith and Rowmors' Franz 1, s½ ne nw 6-18n-9w, Traverse, 15,200,000 gas, so, td 3164 ft.

Van Buren County—Old Bangor: Clapsaddle Oil Co.'s Shelden 1, ne sw se 20-2s-16w, Traverse, pump and flow 110 bbls, td 1006 ft.

Van Buren County—New Geneva: Socony-Vacuum Oil Co.'s Schultze 1, se se se 23-1s-16w, pump and flow 113 bbls, td 1072 ft.

MICHIGAN WILDCATS

Allegan County — Failure: W. S. Cook's Hoerner 1, nw nw nw, 9-3n-12w, Traverse, 1525 ft, td 1604 ft.

Van Buren County—Failures: Harris Oil Co.'s Graham 1, ne ne ne 34-1s-15w, Traverse 1040 ft, td 1046 ft.

A. C. Murray's Shanahan 1, se ne ne 24-4s-14w, Traverse 1090 ft, td 1170 ft.

MONTANA

Carbon County—Elk Basin: Ohio Oil Co.'s Elk 11 or 9, ne ne sw 35-9s-23e, Tensleep 4286-4516 ft, flow 3000 bbls, 6⅝-in, perf 188 holes 4310-4460 ft, elev 4555 ft, td 4476 ft.

Glacier County—Cut Bank: Santa Rita Oil & Gas Co.'s Jacobson 4, c ne nw 18-33n-5w, elev 3868 ft, shot 80 qts, abnd 3057 ft.

R. C. Tarrant's Wiley Jones 5, c se sw 31-34n-5w, abnd 2615 ft.

Toole County—Grandview: Northern Ordnance's Kevin State 1 C-1, c ne ne 25-35n-1e, abnd 2023 ft.

Toole County — Kevin - Sunburst: Adams-Hesla Oil Co.'s McManus 7, nw se se 21-35n-2w, Sunburst 1205-1222 ft, Ellis-Madison 1450-1455 ft, 500 gals acid, pump 20 bbls.

Big West Oil Co.'s Dahlquist 24, ne ne se 21-35n-3w, Ellis-Madison 1735 ft, so, 500 gals acid, abnd 1775 ft.

E. O. Reickhoff et al's Bannister 1, sw se sw 35-37n-3w, shot 30 and 60 qts 2073-2079 ft, abnd 2091 ft.

Toole County—Shelby: Nadeau Bros.' State 1, cwl nw se 36-32n-3w, abnd 900 ft.

MONTANA WILDCATS

Pondera County — Failure: Northern Ordnance's State 1, c ne se 9-28n-6w, abnd in Ribbon sand 3115 ft.

Toole County — Failures: Northern Ordnance's Kiesser 1, c nw nw 30-34n-3w, abnd 1794 ft.

Northern Ordnance's Byrne 1, c nw sw 2-34n-2e, Kootenai 1508, Ribbon sand 1900 ft, Madison 2149 ft, abnd 2158 ft.

NEW MEXICO COMPLETIONS

Eddy County: Geo. F. Getty Oil Co.'s Dooley 9, c se se 23-20s-29e, pump 45 bbls, lime 1362-94 ft.

Nash-Windfohr & Brown's Jackson 10-B, c se ne 25-17s-30e, flow 200 bbls, 2-in, shot 240 qts 3220-80 ft.

Penn-Surgical Co.'s Dunn 1, 7-18s-29e, flow 12 bbls, ⅛-in, shot 570 qts 2500-2640 ft, td 2733 ft.

Premier Oil Co.'s Parke 2-F, c ne se 3-17s-30e, flow 272 bbls, ¾-in, shot 250 qts 2910-85 ft, td 3050 ft.

Lea County — East Lusk: Culbertson and Irwin - Southern Cal. Pet. Corp.'s Lynch-Texaco 4, c se se 20-19s-32e, salt 820-2410 ft, abnd 2820 ft.

OKLAHOMA

Caddo County—W. Cement: Phillips' Oaks 2, ce½ se se 34-6n-10w, Wade 5660-68 ft, 5668-76 ft, 5660-5700 ft, pb 2700 ft, flow 194 bbls 5944 ft.

Comanche County—Fort Sill: Frank Buttram's School Land 2, nw nw sw 16-3n-10w, broken sandy shale 950-55 ft, shot 20 qts, abnd 1010 ft.

Northern Ordnance's Stephens "D" 1, se nw ne 29-3n-10w, sand 769-96 ft, 1000 gals acid, shot 25 qts, pump 10 bbls, td 1010 ft, pb 805 ft.

Creek County—Glenn: Sinclair Prairie's J. F. Berryhill 65, c se ne 16-17n-12e, Glenn 1402 ft, shot 140 qts, pump 3 bbls oil, 2 bbls wtr, 1569 ft.

Garvin County—Pauls Valley: Pure's Teter 9, nw nw nw 31-4n-1e, Bromide 3919 ft, sand 3953 ft, 4068 ft, flow 2257 bbls oil, 4,116,000 gas, ¾-in, 4071 ft.

Texas Co.'s O. W. Patchell "B" 2, nw sw se 25-4n-1w, dual comp, Penn sand prod, flow 606 bbls oil; Bromide sand prod, flow 2206.8 bbls oil, 2,399,475 gas, td 4060 ft.

Garvin County: Pure's Williams Consol. and Anderson-Prichard 2, nw ne ne 36-4n-1w, Penn sand prod, perf 3826-44 ft, 3848-70 ft, flow 1231.60 bbls oil, 873,000 gas; Bromide 3927-4070 ft, flow 2338.8 bbls oil, ¾-in, 1,951,000, 4070 ft, dual comp.

Hughes County—Horn's Corner: Deep Rock's Bilby 1, ne nw nw 28-7n-10e, Wilcox 5020 ft, sand 5044-80 ft, abnd 5105 ft.

Lincoln County — N. McLoud: Stanolind's Sarkey "C" 1, c sw nw 15-12n-2e, Wilcox 5619 ft, flow 160 bbls oil 21 hrs, 1,000,000 gas, 4/64-in, 5620 ft.

Lincoln County—Wilzetta: Blackwell's Sedlacek 1 A se se se 3-12n-5e, Red Fork 3788-3808 ft, abnd 3825 ft.

Muskogee County—Bald Hill: Link's Matthews 5, sw ne ne 19-15n-15e, salt sand 821 ft, 750,000 gas, 875 ft.

Okfuskee County—Gregory: Wells et al's Gregory 4, nw se ne 36-10n-11e, sand 1982-2000 ft, 3,000,000 gas, 2000 ft.

Oklahoma County—W. Edmond: Denver P&R's Genzer 1, c nw nw 5-13n-4w, Hunton 6886 ft, flow 577 bbls, 3/16-in, 5,000,000 gas, 7028 ft.

Okmulgee County—Okmulgee: Wood Oil's Carruth 1 A, se ne ne 28-13n-13e, Morris 1724-37 ft, pb 1745 ft, shot 20 qts, repressure, td 1950 ft.

Okmulgee County: W. H. Price's Hollyman 1 A, c se ne 25-13n-12e, Dutcher 2106-26 ft, 1,800,000 gas, 2150 ft.

Okmulgee County—Pickett Prairie: Sooner's Pense 2, nw ne se 20-16n-11e, Tanaha 2135 ft, abnd 2150 ft.

Okmulgee County—Mounds: Sapulpa Tank's Weldy 1, ne ne ne 30-16n-12e, sand-lime 2203-14 ft, abnd 2214 ft.

Osage County—Avant: Sinclair Prairie's No. 73, nw sw nw 19-23n-12e, B'ville 1620 ft, shot 80 qts, pump 10 bbls, 1749 ft.

Osage County — Big Bend: Oliphant's L. Lohah 1, sw sw nw 20-25n-3e, Layton 2874 ft, flow 300 bbls, ¾-in, 2890 ft.

Osage County—Burbank: Phillips' Osage 17, sw sw nw 30-27n-6e, B'ville 2906 ft, 2963 ft.

Osage County—Bighorse: Cities Service's #494, se se ne 26-27n-11e, Layton 1078-1185 ft, pb 1185 ft, pump 7 bbls oil, 10 bbls wtr, 1964 ft.

Seminole County: Br. Amer's Craddock 1, se nw nw 29-8n-6e, dolomite 4335 ft, pb 4355 ft, 5050 gals acid, pump 50 bbls oil 22 bbls wtr, 4500 ft.

Stephens County—W. Doyle: Phillips' Craven 1, ne ne sw 11-1n-5w, Culberson 5412-30 ft, flow 400 bbls, 4,482,000 gas, ¾-in 6250 ft.

Stephens County—Un-named gas pool: Artesia Inv. Co.'s Sitton 1, nw ne nw 13-3s-6w, abnd 1745 ft.

Tulsa County—Un-named gas pool: Mission Oil's Buchner 1, se sw se 11-22n-13e, Oswego 593-626 ft, 100,000 gas, 665 ft.

OLD WELLS DEEPENED

Okfuskee County — Olympic: Manahan's Bunner 1, se se ne 25-10n-8e, otd 1795 ft, Senora sand 1762 ft, pump 15 bbls, td 1837 ft.

Okfuskee County: Manahan's Bunner 3, ne se ne 25-10n-8e, otd 1809 ft, Senora sand 1781 ft, shot 60 qts 1814-44 ft, pump 12 bbls, td 1849 ft.

Pottawatomie County—Hotulke: Mid-Continent's M. Krouch 1, sw sw se 26-9n-4e, otd 4435 ft, 6000 gals acid, pump 17 bbls oil, 10 bbls wtr, td 4445 ft.

OKLAHOMA WILDCATS

Lincoln County—Failures: Gulf and Texas Co.'s Shingleton 1, c w½ sw sw 7-12n-3e, 1st Wilcox 5505 ft, 2nd Wilcox 5589 ft, pb 5366 ft, abnd 5615 ft.

John J. Fleet's Stevens 1, nw se 3-15n-6e, pink lime 3210 ft, Redf zone 3225 ft, Inola 3325 ft, Bart 3340 ft, brown lime 3473 ft, abnd 3570 ft.

Okfuskee County—Discovery: Peppers Refg. Co.'s Price 1-A, ne sw se 16-10n-9e, 2000 gals acid 3755-3835 ft, 1000 ft salt wtr, pb 3940 ft, perf in Hunt 3745-3845 ft, 2000 gals acid, est 1,750,000 gas, td 4005 ft.

Pittsburg County—Failure: Kubat's Pruitt 1, c nw nw 33-4n-1e, top stained ad 3795 ft, Viola 4133 ft, test salt wtr 4085-91 ft, abnd 4460 ft.

Tillman County—Failure: O. P. Burnham's Ray 1, c ne sw 26-2s-19w, Cisco 3205 ft, Canyon 3921 ft, no show, abnd 5467 ft.

Woodward County—Failure: Northern Ordnance's Bradshaw 1, c se se 28-22n-17w, so 6110-25 ft, dol 9950 ft, Wilcox 10,031 ft, abnd 10,073 ft.

EAST TEXAS

Henderson County — Tri-Cities: Stanolind's Tri-Cities Unit 1-E, 1000 ft snl 441 ft wel lot 13, Jacob Tator sur, elev 337 ft, Georgetown 4852 ft, Paluxy 6060 ft, massive anhydrite 7455-7604 ft, abnd 7680 ft.

Houston County—Grapeland: Geier Bros.-F. B. Jackson's Pridgeon 2 6400 ft wel 7630 ft nsl, J. de J. Procella sur, Woodbine 5943 ft, 8,000,000 gas, est 90 bbls distillate per million, perf 5943-45 ft.

Navarro County—Corsicana-Powell: Byrd & Frost's Lovett 3, 2720 ft from nw 1200 ft nsl, J. Harris sur, pump 54 bbls, Woodbine 2933-35 ft.

Wood County — Quitman: Bridewell-Roger Lacy & Wise's Johnson 1-D, 1522 ft ewl 600 ft nsl, H. Anderson sur A-9, elev 432 ft, Georgetown 5018 ft, Paluxy series 6213 ft, sand 6223 ft, flow 712 bbls, ¼-in, perf 6224-6320 ft, td 6335 ft.

Delta Drlg. Co. et al's Blalock 1-B, 2150 ft wel 2300 ft snl, S. G. Purse sur, elev 458 ft, Georgetown 5132 ft, Paluxy series 6285 tf, sand 6296-6342 ft, water 6351 ft, flow 756 bbls, ¼-in, perf 6296-6340 ft, td 6390 ft.

EAST TEXAS WILDCATS

Henderson County — Failure: Continental-Pete Wiggins-Ed. Hyde's Warren 1, 330 ft snl 1550 ft wel tract, J. F. Lambright sur, elev 400 ft, Woodbine 4655 ft, abnd 4817 ft.

Hunt County—Failure: M. P. Stewart-Paul Dalton & Morrissey's Rollins 1, 1980 ft snl 660 ft from m/n/w ls 554-ac tr, Joseph Hiller sur, elev 562 ft, base Austin 1875 ft, Woodbine 2410 ft, Georgetown 3345 ft, abnd 4260 ft.

WEST TEXAS

Andrews County—Mascho: Fuhrman Pet. Corp.'s Lockhart-Brown 1-C, 660 ft nsl 2001 ft ewl PSL 24, blk A-42, flow 418 bbls, ¾-in, shot 420 qts 4399-4600 ft, td 4625 ft.

Seaboard Oil Co.'s Thornberry 7, 1995 ft nsl 666 ft wel PSL 18, blok A-42, flow 253 bbls, ¾-in, shot 550 qts 4300-4564 ft, td 4781 ft, pb 4580 ft.

Andrews County—North Cowden: Atlantic and Sun's Holt 3-E, c se sw T&P 8, blk 43, T-1-N, pump 215 bbls, shot 337 qts 4537-4672 ft.

Cochran County—Slaughter: A. A. A. Oil Corp.'s Boyd-Texaco 6, 638 ft ewl 683 ft nsl lab 9, leag 53, Oldham CSL, flow 464 bbls, ⅜-in, acid 10,000 gals 5010-40 ft.

Continental's Dean 17-58, 6022 ft ewl 1952 ft nsl Lge 58, Lipscomb CSL, flow 290 bbls cas, acid 12,000 gals 4950-5001 ft.

Texas Co.'s Mallet 13-F, 580 ft out nec lab 17, Lge 51, Scurry CSL, flow 657 bbls, acid 12,000 gals 4995-5040 ft.

Ector County—Foster: Cities Service's Bagley 9-A, 640 ft nsl 520 ft wel nw T&P 17, blk 43, T-2-S, pump 150 bbls, shot 430 qts 4210-4340 ft.

Ector County — Goldsmith: Stanolind's Schanbauer 2-N, 330 ft nsl 1000 ft ewl PSL 13, blk A, flow 268 bbls oil, 4% water, 22/64-in, acid 2000 gals 4125-69 ft.

Ector County—North Cowden: Stanolind's Midland Farms 3-E, 2092 ft n 154 w of SWc T&P blk 42, but in sec 100, W. L. Callahan sur, pump 283 bbls oil, 82 bbls water, shot 435 qts 4400-4577 ft, td 4582 ft.

Texas Co.'s Holt 28, 1981 ft snl 2025 ft ewl T&P 10, blk 43, t-1-N, flow 388 bbls, 2-in, shot 380 qts 4509-4700 ft, td 4705 ft.

Gaines County—Seminole: Amerada's Robertson 7, c sw ne W. T. Ry. 196, blk G, flow 248 bbls, ½-in, acid 5000 gals 5207-70 ft.

Gaines County—Wasson: Amon G. Carter's Langdon 5-A, nw nw se PSL 43, blk AX, flow 789 bbls oil, 6% water, 2-in, acid 5000 gals 4955-5010 ft.

Hockley County—Slaughter: Eugene Constantin et al's Elliott 4-B, 440 ft out nec lab 6, Lge 42, Rains CSL, flow 690 bbls, acid 8000 gals 4842-63 ft.

Eugene Constantin et al's Lawless 2, 440 ft out NWc lab 7, Lge 42, Rains CSL, flow 615 bbls, acid 7000 gals 4845-74 ft.

Gulf's Gordon 3, 2310 ft snl 660 ft ewl PSL 12, blk X, flow 2096 bbls, acid 12,000 gals 5037-65 ft.

Jerry Hawkins et al's Mallet 56-A, 580 ft out SWc, lab 12, Lge 47, Edwards CSL, flow 704 bbls, acid 12,500 gals 4912-90 ft.

Humble's Coons 11, 4111 ft snl 2021 ft ewl PSL 11, blk X, flow 1208 bbls, acid 7000 gals, perf 4915-5026 ft, td 5040 ft.

T. F. Morrow et al's Mallet 58-A, 580 ft out sec lab 1, Lge 48, Edwards CSL, flow 637 bbls, acid 10,000 gals 4850-95 ft.

Texas Co.'s Slaughter 145, 580 ft out swc lab 70, Lge 38, Zavalla CSL, flow 1261 bbls, acid 11,000 gals 4900-5004 ft.

Howard County: Ray Oil Co.'s Read 1-B, se se sw T&P 37, blk 30, T-1-N, elev 2284 ft, abnd 2967 ft.

Lubbock County—Stennett: Stanolind's Alverson 1, 660 ft out swc lab 23, Lge 4, San Augustine CSL, elev 3126 ft, abnd 5014 ft.

Mitchell County — Iatan-East Howard: Standard of Texas' Foster 12, c se se T&P 4, blk 29, T-1-S, abnd 3498 ft.

Pecos County—Un-named: Magnolia and Anderson-Prichard's Powell-State 2, c n¼ of s¼ H&GN 96, blk 10, Ellenburger 4460 ft, granite 4685 ft, abnd 4700 ft.

Pecos County — Taylor-Link: Cardinal Oil Co.'s University 4-F, 1036 ft nsl 330 ft wel sec 14, blk 16, pump 11 bbls oil, 11 bbls water, shot 60 qts 1920-37 ft, td 1949 ft.

Scurry County—Northwest: A. L. and C. L. Wasson's Chapman-Magnolia 4-A, nw se sw H&TC 100, blk 97, high-pressure air producer for pumping power, pay 1190-1203 ft.

Yoakum County — Wasson: Humle's Randall 22, c nw se sec 859, flow 316 bbls, 26/64-in, acid 7000 gals, perf 5000-5110 ft, td 5116 ft.

WEST TEXAS OLD WELLS DEEPENED

Andrews County—Embar: Phillips' Cowden-Embar 1, 660 ft s of s line sec 31, 660 ft ewl T&P 5, blk 44, T-2-N, otd 4336 ft, elev 3238 ft, Simpson 7935 ft, Ellen 8553 ft, flow 107 bbls, 3/16-in, acid 3500 gals Clear Fork perf, td 8576 ft, pb 6242 ft.

Upton County—McCamey: Shell's Bowen 30, GC&SF sec 6, otd 2100 ft, pump 191 bbls oil, 18 bbls water, lime 2038-2226 ft.

Shell's Bowen 35, GC&SF sec 6, otd 2200 ft, pump 49 bbls oil, 4 bbls water 7 hrs, acid 1000 gals 2142-2263 ft.

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UNITED STATES WELL COMPLETIONS

Winkler County—Keystone: Richardson & Bass' Jenkins-Conoco 1, 440 ft out swc, PSL 13, blk 77, otd 3368 ft, flow 50 bbls gas lift, shot 160 qts 3332-3480 ft.

WEST TEXAS WILDCAT

Coke County—Failure: Harley Sadler et al's Mims 1, ne ne nw T&P 46, blk W, elev 2334 ft, abnd 1851 ft.

WEST CENTRAL TEXAS

Jones County: Condor Pet. Co.'s Sayles 37, 1620 ft wel T&P 5, blk 20, 660 ft nw No. 36, pump 99 bbls, sand 1919-35 ft td 1937 ft.

Jones County—Wimberly: Harry Hines et al's Wimberly 4, 330 ft out nwc s½ blk 87, DeWitt CSL, dual completion, flow 384 bbls, ¾-in, acid upper pay 2000 gals 2240-50 ft; flow 1056 bbls, ¾-in, acid 1000 gals lower pay (broken) 2513-85 ft, td 2670 ft.

WEST CENTRAL TEXAS OLD WELL DEEPENED

Jones County—Wimberly: R. L. Foree-W. H. Sanford's Fikes 1, 200 ft snl 300 ft wel nw blk 105, DeWitt CSL, otd 2305 ft, dual well, flow 1668 bbls, ¾-in, acid 1500 gals broken pay 2435-2521 ft, td 2533 ft.

WEST CENTRAL TEXAS WILDCATS

Jones County—Failures: Alston & Pace's Penrod 1, 467 ft out nwc sw T&P 28, blk 18, elev 1826 ft, abnd 3010 ft.

Fain & McGaha's Collins-Campbell 1, 1820 ft nsl 1805 ft ewl subdiv 5, John Winters sur 138, elev 1726 ft, abnd 2255 ft.

Shackelford County: R. H. Roark et al's Green 2, 330 ft snl 1980 ft ewl s½ T&P Ry. 49, blk 12, abnd 1214 ft.

Roeser-Pendleton-Conoco's Cook 15-A-62, 126 ft wel 330 ft nsl ne¼ E. T. Ry. sec 62, elev 1566 ft, abnd 1408 ft.

TEXAS GULF COAST

Brazos County—Millican: Phillips' Dunlap 1, 1650 ft fr sl and 4700 ft fr wl, A. Millican sur, abnd 3900 ft.

Chambers County—Cedar Point: Standard of Texas' State-Bay 118, 1420 ft fr ne and 2210 ft fr sel sec 118, 640-ac lse, 7-in 4290 ft, perf 4258-70 ft, flow 136 bbls, ⅛-in, td 4291 ft.

Fort Bend County—Clodine: Providence Oil Co.'s Hubert & Thorpe 1, 40-acre unit, John Brock sur, A-110, abnd 7553 ft.

Stanolind's Cinco Ranch 5, 369-ac tr, John Brock sur, 1917 ft fr wl and 1856 ft fr sl lse, 5½-in 7504 ft, perf 7502-03 ft, 151 bbls, ⅛-in, td 7504 ft.

Hardin County—Sour Lake: Earl C. Hankamer's Mobray 1, 10-ac tr, 127 ft fr e'ly wl and 330 ft fr sl of tr, 7-in 2736 ft, acidized, flow 144 bbls, 10/64-in, td 2819 ft.

Liberty County—Hardin: E. Constantin, Jr.'s Humphreys 1, 42-ac lse, 478 ft fr el and 507 ft fr nl lse, abnd 7680 ft.

Liberty County—Esperson: General Crude's City Investment 3, 302-ac tr, 1675 ft fr wl and 520 ft fr most s'ly sl, sur 22, 5½-in 8334 ft, perf 8225-8385 ft, flow 75 bbls, ⅛-in, td 9087 ft.

Matagorda County—North Bay City: Ohio Oil Co.'s McDonald 2, ne'ly offset McDonald 1, 5½-in 8795 ft, perf 7870-73 ft, flow 227 bbls, ⅛-in, td 8821 ft.

TEXAS GULF COAST WILDCATS

Fort Bend County—Failure: Harold Link's Farmer 1, 52-ac tr, Robert Hodge sur, 3 mi s Needville, abnd 5512 ft.

Jefferson County—Failures: Rowan Drilling Co.'s Broussard 1, 100-ac tr, Stephen Eton sur, A-22, abnd 8736 ft.

Sun's McFaddin 1, East Spindletop area, lot 146, McFaddin & Wise & Kyle subdvn, P. Humphrey Lge, abnd 6721 ft.

LOWER TEXAS COAST

Dewitt County: Superior of Calif.'s Martha Ann Reidel 2, 330 ft fr sw 700 ft fr sel 94-ac lse 700 ft fr sel 1600 ft fr swl, Marcus Sewell sur 8, A-432, Pettus 4210-20, oil sd 7588-7619 ft, perf 7605-10 ft, pump 225 bbls 35.1-gr, 5/32-in, td 7622 ft.

Jackson County—Maurbro: Humble's Mike Strauss 11, 467 ft fr e 400 ft fr nwl 530, 78-ac lse, Abraham Clare sur, top pay sd 5212 ft, pump 184 bbls, 3/16-in, td 5216 ft.

Jackson County—West Ranch: Humble's Mrs. M. H. Toney 13, 467 ft ne of Menefee Bayou 1064 ft nw Toney Gr 12, may put on pump, td 5735, pb 5091 ft.

Jim Wells County—Von Blucher-Outpost: La Gloria Corp. Lillie Seeligson et al 1, 660 ft fr e 2240 ft fr nl sec 10, R. P. Haldeman sbdn Seeligson Ranch, Ignacio de la Pena Gr, sand 5776-83, 6082-6102, abnd 7580 ft.

Karnes County—Porter, NE: Continental's Birdie Porter 2, 330 ft fr nw&swl 275-ac lse, Victor Blanco Gr A-3, Pettus 4068-4102 ft, abnd 4102 ft.

Superior of Calif.'s Gee. Schrade 4, 1583 ft fr se 1722 ft fr nel 757 ft fr e'ly nwl 235.7-ac lse, Victor Blanco Gr A-3, Pettus 4051-63 ft, perf 4051-60 ft, pump 36 bbls 39-gr, 5¼-in, td 4073 ft.

Kleberg County—Stratton: Humble's King Ranch-Paso Ancho 24, 660 ft alg nl Santa Gertrudis Gr, se cor G. Phillip Wardner Tr, 5940 ft ssw ra 1320 ft ese King 27, elev 92 ft, pay sd 6553 ft, perf 6576-86 ft, pump 152 bbls 42.2-gr, ¾-in, td 7117 ft.

Nueces County—Baldwin: Magnolia's J. C. Baldwin 13, 990 ft nne Baldwin 12, 330 ft fr el 2800 ft fr sl 805-ac lse BS&F sur 165, A-55, top pay sd 3908 ft, perf 3909-12 ft, pump 240 bbls 24.6-gr, ¼-in, td 3955 ft, pb 3919 ft.

Nueces County—Stratton: Tom Graham's E. B. Browning 1-A, 467 ft fr s&wl of s 60-ac of 120-ac lse, elev 92 ft, dual comp, Bertram 6542-62 ft, perf 6542-52 ft, pump 90 bbls, 7/64-in; Sellers sd 6632-40 ft, perf 6632-40 ft, pump 189.36 bbls 43-gr, 9/64-in, td 6720 ft.

Victoria County—North McFaddin: Union Producing Co.'s J. D. Rowlett 1, 2100 ft fr nwl, Jules Varin sur A-123, 4200 ft sw Union's Rydolph 2, perf 2240-58 ft, slt wtr, abnd 5500 ft.

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UNITED STATES WELL COMPLETIONS

LOWER TEXAS COAST NEW PAYS

Aransas County—St. Charles: Continental's St. Charles Co. 6, 1320 ft fr nl 8000 ft fr el, E. C. Sloan sur A-195, 4000 e fr e shore St. Charles Bay 46, 605-ac lse, perf 9242-50, 8090-8118 ft, flow 124 bbls oil, 2,800,000 gas, 3/16-in, td 9490 ft.

Jim Wells County—North Magnolia City: Edwin M. Jones' M. A. Evetts 2, 780 ft fr e 558 ft fr nl s 160-ac of Tr 3, Roberts & White sbdn, Marcelino Lopez Gr, elev 146.8 fr gr, dual comp; gas sd 5108-22 ft, perf 5107-11 ft, flow 29 bbls 49-gr wtr-white cond, 6,600,000 gas, ¾-in and ¼-in; oil sd 5405-18 ft, perf 5414-17 ft, pump 943.92 bbls 30.7-gr, 3/16-in, td 5515 ft.

LOWER TEXAS COAST WILDCAT

Burleson County—Failure: Chas. E. Fraser et al's John Marek et al 1, 330 ft fr n 620 ft fr el 219-ac tr, Jas. Buchanan sur, abnd 5352 ft.

NORTH TEXAS

Archer County—Little Wichita: Deep Oil Dev. Co.'s Wilson 26, 330 ft out nwc sec 118, ATNCL, Bend 4874 ft, flow 1838 bbls, 2-in, acid 750 gals perf 4888-95 ft, td 4985 ft.

Clay County—Joy: Shell's Cook 1, 330 ft out nec 132.61-ac lse, sec 31, H. Williams sur, Miss 5979 ft, flow 3224 bbls, 2-in, acid 2000 gals 5990-6049 ft.

Clay County: Perkins-Cullum's Taylor 6-C, 465 ft snl 770 ft ewl blk 43, Bacon sur, pump 75 bbls, sand 1101-18 ft.

W. H. Spradling et al's Taylor-Elliott 7, 1650 ft nsl 414 ft ewl blk 55, Bacon sur, abnd 1150 ft.

Sussex Oil Corp.'s Glascow 34, 165 ft snl 150 ft fr swl blk 34, Bacon sur, pump 128 bbls, 1063-76 ft.

Cooke County — Walnut Bend: Magnolia's McGeorge, 3,330 ft snl 577 ft wel sec 72, Fannin CSL, Winger 5544 ft, flow 672 bbls, 2-in, perf 5543-56 ft, td 5571 ft.

Sinclair Prairie's Cox 13-B, 1092 ft nsl 525 ft ewl sec 60, Fannin CSL, Winger 5395 ft, flow 1510 bbls, 2-in, perf 5405-35 ft, td 5486 ft.

Texas Co.'s Raiser 2, 1320 ft snl 330 ft ewl of s-98 ac sec 80, Fannin CSL, flow 972 bbls, 2-in, Winger 5569 ft, perf 5560-75 ft, 5583-5616 ft, td 5637 ft.

Cooke County—South Walnut Bend: Sinclair Prairie's Art McGeorge 1, 330 ft n of m/n/s 966 ft ewl sec 65, Fannin CSL, Ramsey 4917 ft, Winger 5512 ft, Simpson 5748 ft, abnd 5764 ft.

Jack County—Ellis: Hanlon & Buchanan's Ellis-Dubose 4-B, 466 ft snl 495 ft ewl blk 6, J. W. Williams sur, Bend 4726 ft, flow 400 bbls, ¼-in, acid 3000 gals 4728-48 ft.

Montague County—Davenport: Lesh & McCall's Davenport 7, 1660 ft nsl 483 ft ewl, J. Fitch sur, pump 62 bbls, perf 2351-61 ft, 2388-94 ft, td 2925 ft in granite.

Montague County—Hildreth: Continental's Clisbee 2, 1325 ft snl 1877 ft wel E. T. Ry. sec 57, Bend 6026 ft, Barnett 6370 ft, flow 480 bbls, 15/64-in, perf 6098-6103 ft, td 6400 ft.

Wichita County: Consolidated Oil Co.'s Davidson 1-B, J. R. McDowell sur, abnd 626 ft.

Wichita County—Airport: Consolidated Oil Co.'s Cook 1-A, 495 ft out nwc sec 13, Cherokee CSL, Bend 5300 ft, abnd 5548 ft.

Wichita County — West: Continental and Dillard's Waggoner 1, 5965 ft s 659 ft e of nec West 411.17-ac tr, but in W. T. Buntin sur, flow 112 bbls, 15/64-in, Strawn 4236-53 ft, td 4260 ft.

Young County: B. C. Gilmore et al's King 2, 167 ft snl 1270 ft ewl of 130-ac tr, L. W. Ross sur, abnd 719 ft.

NORTH TEXAS WILDCATS

Archer County—Discovery: Hedrick Oil Co.'s C. E. Carter 1, 1320 ft nsl 990 ft ewl sec 21, blk 5, Clark-Plumb sur, elev 1006 ft, pump 65 bbls, sand 875-85 ft.

Montague County—Failure: Ross Drlg. Co.'s Huddleston 1, 330 ft snl 990 ft ewl, J. G. King sur A-414, abnd 4131 ft.

SOUTHWEST TEXAS

Duval County—Conoco Driscoll: Continental Oil Co.'s Robt. Driscoll 24-B, 775 ft fr sl 15,000 ft fr el, 12,000-ac lse, top pay sd 2480 ft, perf 2480-2500 ft, flow est 3,000,000 gas, ¾-in, td 2969 ft, pb 2530 ft.

Jim Hogg County—Weil: Sun Oil Co.'s Weil Bros. 7, 1940 ft fr el 5160 ft fr sl, R. Sais Gr, perf 5075-77, 5073-75, 5077-78 ft, so&sw 5075-99 ft, temp abnd 5200 ft.

Starr County—Cameron-Outpost: Continental's Dallas Jt. Stk. Ld. Bk. 1, 990 ft fr n 330 ft fr el, CCSD&RGNG sur 509, 617-ac lse, abnd 4995 ft.

Starr County—Lockhart: Lockhart & Davenport's Alace A. Dyer et al 1, 330 ft fr n&wl of Sh 69, J. A. de la Garza Falcon Porc 80, A-74, elev 380 ft df, abnd 4024 ft.

SOUTH CENTRAL TEXAS

Bastrop County—Failure: R. R. Ogden's A. B. Cast 1, 1180 ft fr se 5480 ft fr nwl, Joshua Gray sur, serp sd 2152-62, 2230-60, chalk 2260-75, abnd 2275 ft.

Wilson County — Failure: Stanolind O&G Co.'s C. R. Eschenberg 1, 1715 nw alg swl fr s cor 299-ac tr th 4 mi se of Floresville, abnd 4900 ft.

TEXAS PANHANDLE

Carson County: Cities Service's Eller 1-a, 330 ft nsl 1030 ft ewl s½ sw I&GN 9, blk 7, elev 3417 ft, 1,200,000 gas, pay 2755-3062 ft, td 3340 ft, pb 3113 ft.

Power Pet. Co.'s Jordan-Brown 4-A, ne sw se I&GN 124, blk 4, pump 22 bbls, pay 3015-97 ft.

WYOMING

Big Horn County—Byron: Ohio Oil Co.'s George Worth 1, ne sw Lot 39-56n-97w, flow 350 bbls, 6⅝-in, Tensleep 5348, td 5510 ft.

Fremont County—Steamboat Butte: British American's Tribal 2-E, ne sw nw 5-3n-1w, Sundance 5119 ft, pump 443 bbls 5228 ft.

Natrona County—Cole Creek: General Petroleum's State 55, nw nw se 16-35n-77w, pump 30 bbls, Shannon 4604-40 ft.

General Petroleum Corp.'s Government 75, nw ne sw 21-35n-77w, Shannon sand 4500-4537 ft, pump 80 bbls, 5-in.

Park County—Elk Basin: Continental's Elk 2-102, c nl ne 24-58n-100w, flow 749 bbls, 7-in, perf 3950-4051 ft, td 4140 ft.

Park County—Oregon Basin: Ohio Oil Co.'s Custer Petroleum 8, ne sw se 32-52n-100w, pump 400 bbls, 8⅝-in, Embar 3220, Tensleep 3373 ft, td 3520 ft.

Sublette County—South Piney Creek: H. H. Howell's Noble 1, sw nw ne 11-29n-113w, abnd 1760 ft.

H. H. Howell's Noble 2, sw nw nw 11-29n-113w, pump 15 bbls, td 948 ft.

United States Wildcat Starts

ARKANSAS

Columbia County: Tide Water's L. H. Pearce 1, 10-18s-20w, rig.

Desha County: Hunt Oil Co.'s J. B. Thornton 1, 250 n of c nw ne 23-7s-1e, dk.

Franklin County: Southern United Gas Co.'s G. C. Carter 1, c ne nw 21-9n-27w, lcn.

Hempsted County: Barnsdall Oil Co.'s James Brunson 1, c nw nw 36-14s-25w, 6500 ft, lcn.

Lafayette County: Kerlyn Oil Co.'s International Paper Co. 1, c nw sw nw 19-19s-24w, lcn.

Union County: L. B. Manley's Wood 1, ne sw sw 25-18s-13w, rig.

CALIFORNIA

Kern County: Seaboard Oil Corp.'s Garrison-Davis 1, sw nw sw 30-29-29, Edison area, gr.

Texas Co.'s KCL 1-13, sw sw sw 13-28-28, Round Mountain area, lcn.

Dwight G. Vedder's 1-18, nw nw se 18-27-28, Mt. Poso area, rig.

Los Angeles County: Chanslor Canfield Midway Oil Co.'s East Whittier Comm. 1, 550 n on c/l Ocean View Ave. fr c/l Whittier Blvd., thence 132 ft e at r/a, Whittier area, rig.

Santa Barbara County: J. I. Anderson's Elliott 1, 6-9-32, Sisquoc area, foundation.

ILLINOIS

Bond County: C. E. Walters' H. Tidwell 1, se se nw 33-4n-3w, lcn.

Crawford County: Joe Dawson et al's George 1, nw ne ne 18-8n-3w, lcn.

Edwards County: Phillips' Sam Fieber 1, se ne se 6-3s-10e, dr.

Franklin County: Nat'l Assoc. Pet. Co.'s Deputy 1-A, sw se sw 26-5s-2e, lcn.

Bell & Zoller Mining's Ziegler Coal & Coke Co. 3, se sw sw 23-7s-1e, lcn.

Jasper County: Big Chief Drlg. Co.'s Oran Helach 1, e½ ne se 27-8n-9e, lcn.

Wayne County: Ryan & Fortner's Woods 1, se ne nw 13-2s-9e, lcn.

INDIANA

Blackford County: W. A. Rehfield's R. Slusher 1, c sw sw 16-25n-10e, lcn.

Carroll County: Perfect Oil Co.'s F. L. Sheppard 1, nw sw nw 23-25n-3w, lcn.

Jay County: Farm Bureau's Jacob Binegar 1, se ne nw 29-24n-13e, lcn.

KENTUCKY

Webster County: Eslich et al's Jeff Honor 1, 2-L-21, lcn.

Eslich et al's Carl Curry 1, 3-L-21, lcn.

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Mechanical experience and engineering background required. This is a permanent position offering good starting salary with opportunity for substantial increased remuneration.

Replies will be held in strict confidence and should give qualifications, age, draft status and where you can be contacted during next month. Our employees know of this advertisement.

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c/o The Oil Weekly, Houston, Texas

NORTH LOUISIANA

Ouachita Parish: Westgate Greenland Oil Co.'s Werner 1, 708n 1872e of swc 9-17n-2e, lcn.

Natchitoches Parish: J. M. Breedlove's Adrian 1, 660e 660n of swc 2-11n-8w, lcn.

SOUTH LOUISIANA

Cameron Parish—Black Bayou: Magnolia's Moore 2, 330 ft n and w of ne cor nw¼ se¼, sec 13-12s-12w, lcn.

MICHIGAN

Gratiot County: Prudential Oil & Gas Co.'s Schnnap 1, c 19-11n-4w, dr.

A. E. William's Ryan 1, sw sw se 32-10n-1w, rig.

Lapeer County: Clarence Wilcox's Butler 1, sw ne se 27-10n-12e, rig.

Clarence Wilcox's Sohn 1, nw nw nw 29-9n-12e, lcn.

Van Buren County: S. L. McCall's Griffith 7, sw sw ne 17-1s-15w, lcn.

OKLAHOMA

Cleveland County: Kerlyn Loveless 1, nw nw ne 14-7n-1w, c & p.

Love County: F. W. Merrick's Tate 1, se se 6-6s-2e, lcn 4500-ft test.

Payne County: J. E. Crosbie's Wyatt 1, ne sw 25-19n-4e, dr 985 ft.

Pontotoc County: Patsy Oil's Norris 1, c s½ ne ne 25-2n-7e, dk.

NORTH TEXAS

Clay County: Premier Ref. Co.-Joe A. Humphrey's Wines 1, 467 ft out swc lot 5, J. J. Hand sur A-175, rur for 6500-ft test.

Cooke County: F. W. Lausen and C. L. Wagner's J. G. Bonner 1, 330 ft out sec 172.2-ac tr, J. F. Lindheimer sur A-572, lcn 2500-ft test.

Denton County: Sohio Producing Co.'s Ed. Sanders 1, 330 ft out nwc, A. C. Warren sur A-1387, lcn 4500-ft test.

Jack County: Hanlon & Buchanan's Johnson Bros. 1, 1708 ft sni 500 ft ewl of 131⅛-ac tr, John O'Neal sur A-455, 4 mi nw Jacksboro, lcn 6000-ft test.

D. L. Johnson and Olson Bros.' J. A. Crum 1, 2157 ft nsl 2640 ft ewl, Nancy P. Overby sur A-452, lcn 3300-ft test.

S. & E. Oil Co.'s Boyd 1, 1280 ft nsl 561 ft ewl lease, I. N. Wright sur, lcn 3500-ft test.

Wise County: Stanolind's L. M. Lewis 1, 660 ft out swc sec 8, Falls CSL sur, lcn 6500-ft test.

Young County: Auto Ordnance Corp.-Hooper-Byrne et al's S. Dozier 1, 467 ft fr ne 467 ft fr nw lines, C. P. Heartt sur A-131, lcn 4950-ft test.

Northern Ordnance's J. A. Horton 1, 330 ft out swc sec 1906, TE&L Co. sur, lcn 5200-ft test.

TEXAS PANHANDLE

Dallam County: Pure's J. T. Sneed, Jr., 1, ne ne sec 13, blk 18, CSL, rur, Ordovician test.

TEXAS GULF COAST

Chambers County: Texas Co.'s Middleton 1, 4 mi n High Island, R. M. White sur, 370-ac lse, lcn 9000 ft test.

Jefferson County: Shell and Humble's McFaddin 1-D, 7 mi sw Port Arthur, 400 ft fr nl and 2440 ft fr wl, T&NO sur 317, A-301, lcn.

LOWER TEXAS GULF COAST

Bee County: Edwin B. Cox and Jake L. Hamon's Beedy 1, 330 ft fr n&wl 110.8-ac lse, J. & M. Keating sur A-33, 5500-ft test, dk, moving in rig.

Karnes County: Amerada's J. F. Wood 1, 467 ft fr ne'ly nel, 467 ft fr nw'ly sel 379-ac tr, Marcia de Jesus Ybaro sur A-446, orig staked as Dan Auld and W. W. Carter's Ada S. Wood 1, 10,000-ft Wilcox test.

San Patricio County: Henshaw Bros. and Coastal Refineries' L. Horn 1, 467 ft fr s and el 58.36-ac lse sec 8, Cubage and Miller sbdn, J. de la Garza Gr, 7500-ft test, moving in rig.

Victoria County: M. S. Shriver's Warden-Lowery 1, 520 ft fr ene and wswl 720 ft fr nnwl 80-ac lse, McDonough sur, lcn 5600-ft test,

SOUTHWEST TEXAS

Jim Hogg County: Texas Co.'s Yaeger 1, 330 ft fr n&el 1100-ac lse, R. Garza sur 222, A-123, lcn.

Starr County: Geo. R. Boyle's Guerra 1, 1930 ft fr nw 10,160 ft fr swl tr 5, Por 110, washing down to deepen to Yegua.

Circle Oil Co.'s Saenz 1, 660 ft fr s&wl of n 160-ac of sh 21-B, Por 106, lcn 4000-ft test.

T. E. Stephens' Salinas 1, 350 ft fr se 3250 ft fr swl 1220-ac lse, Tr 1, lcn 2500-ft test.

Webb County: O. W. Killam's E. Garcia Est. 1, 1048 ft fr w 2170 ft fr nl, 330 ft fr s&el blk 38, sur 592, Los Ojuelos Gr, elev 872.7 ft gr, lcn 2500-ft test.

SOUTH CENTRAL TEXAS

Caldwell County: Marts & Beaven's Brite Hours 1, 330 ft fr sw 1250 ft fr sel 200-ac lse, abt 1750 ft fr sw 10,700 ft fr nwl, Jasper Gilbert sur A-113, abnd 3075 ft, will deepen to 3200 ft to Edwards lime.

Wilson County: L. D. Ormsby's V. S. Riley 1, 330 ft fr ssel enel 122.7-ac lse, Joseph Reynolds sur, 5500 Edwards test, bldg dk, mi.

EAST TEXAS

Hunt County: Stanolind's G. V. Wilkins 1, 600 ft wel 2842 ft snl, E. F. Anderson sur, Pecan 1190 ft, Gober 1940 ft, dr 4310 ft.

Leon County: Carter-Gragg Oil Co. and Humble's Richmond 1, 2750 ft sw of ne 2450 ft se of nw ls, L. O. McMillan sur, 5 mi se Oakwood, dr 3920 ft.

Rusk County: N. H. Wheless et al's Walker 1, 3030 ft wel 660 ft nsl, Alfred G. Walling sur, 9 mi ne Henderson, elev 394 ft, dr 1800 ft.

Wood County: George Sutton et al's J. F. Ballard 1, 500 ft wel 660 ft nsl, A. Campbell sur, 1¼ mi sw Golden, lcn Paluxy test.

Sabine County: Delta Drilling Co.'s Pineland-Ridge 1, sw¼, bk 5, Benjamin Lindsey sur, near Hemphill, 8000 ft, dk.

WEST TEXAS

Culberson County: O. C. Woods et al's J. A. Barfield 1, c sw se, PSL 17, blk 82, lcn 3000-ft cable test.

Yoakum County: E. N. Cain and L. L. Horne's Graham 1, c sw se sec 327, blk D, J. H. Gibson sur, lcn 5500-ft test.

WYOMING

Hot Springs County: Glen Oil Co.'s 1, ne ne sw 21-42n-92w, Lysite structure, loc.

Squeaks from the Bull Wheel

Cool as a Cucumber!

A squadron observer was called in by his commanding officer after an air raid and asked if he had been nervous during the attack.

"No, sir," was the reply. "I was cool as a cucumber."

"I'm glad to hear that," smiled the CO. "It appeared that you may have been a little rattled when you called in that there were 27,000 bombers coming over at 18 feet."

How to Drive a Nail

From the technical manual of the engineer corps (TM 5-226), these instructions:

"Chapter 3, Tools: Section III, Driving:

"(1) To drive a nail

a. Hold the nail in place with the thumb and first two fingers of one hand.

b. Grasp hammer handle.

c. Tap the head of the nail lightly to start it into the wood and remove guiding hand.

d. Drive the nail."

Embryo Diplomat

"Where have you been, Johnnie?"

"Playing ball, Mother."

"I told you to beat the rug, didn't I?"

"No, ma'am, you told me to hang the rug on the line and then beat it."

Stranger in Camp

An officer giving a lecture in an army classroom suddenly turned upon a man aimlessly looking about the room.

Pointing an accusing finger the officer barked: "What is the Dewey decimal system used for?"

The man looked wonderingly at him. "I dunno."

Exasperated, the officer demanded, "What's your organization, soldier?"

"Haven't got any, mister," the man replied. "I'm just the Coca-Cola man here to refill the machine, wherever it is."

Another Tough Marine Story

A couple of leatherneck aviators had been shot down and were floating around the Pacific in their rubber boat when a Jap submarine surfaced and its crew called on the Americans to surrender.

The Marine flyers held a whispered conference.

"That's the stuff," said one to the other. "Let 'em think we're giving up. Then, when they get close — we'll ram 'em."

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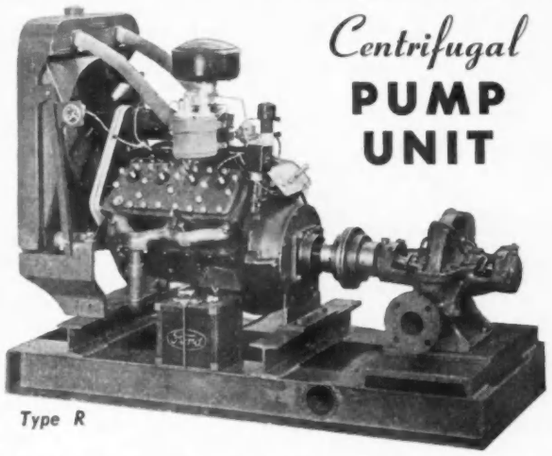

Type R

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Worthington Pumps are adaptable for use with engines or motors of any specified type or manufacture, to provide a complete pumping unit.

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They'll do their job

. . . if we'll do ours!

Our fighting men are giving 'em the works—and they'll keep it up until Victory is won. But they're depending on us to do *our* job on the home front. They are depending on us to work a full day *every* day . . . to conserve gas, oil, rubber, metal . . . to buy nothing except necessities and invest the balance of our incomes in War Bonds. They're doing their job—*let's get tough with ourselves* and do our job, too!

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MINERAL WELLS, *Texas*

Notes for the Equipment Buyer and User

Improved Heat Exchanger

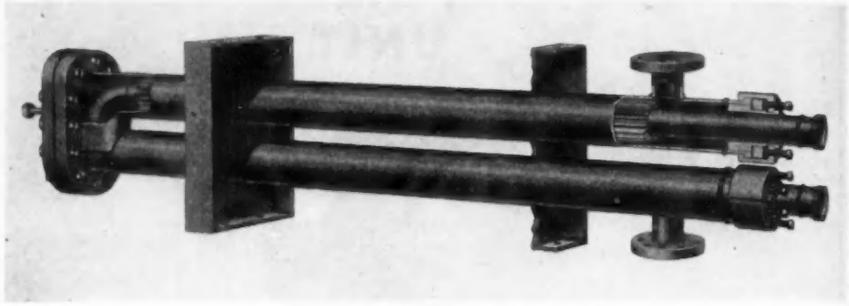
THE BROWN FINTUBE COMPANY

The Brown Fintube Company, Elyria, Ohio, has introduced an improved model of its sectional "hairpin" heat exchanger.

A non-removable rear-end assembly features the improved exchanger. The operator is required only to remove the bolts, back the cover plate off far enough to clear the plates of the adjacent section, then swing the plate through a 180-degree arc, and rebolt it in this position to gain clear, unobstructed entrance into the exchanger.

The new "head" seal consists of a solid ring and two split collars tightened with cap screws and can be assembled with an eight-inch crescent wrench.

Welded one-piece "hairpins" prevent any mixing of the tube-side and shell-side commodities.



Brown Type BFT-1 Hairpin Exchanger Section

Oil Field Equipment Catalog

Alten's Foundry and Machine Works, Lancaster, Ohio, has printed a new catalog of their oil field equipment which will be mailed on request. Several pages are given to the Alten Pumping Units, including two pages of charts for pumping calculations on production horse power required, torque rating, acceleration factor, theoretical loss of stroke, over-travel of plunger, static polish rod load, polish rod load in pounds. All parts are illustrated.

A-1 Bit and Tool Company Buys Universal Core Barrel Firm

The A-1 Bit and Tool Company, Houston, Texas, has acquired the interests of George J. Barrett et al, owners of the Universal Core Barrel Company. Property acquired includes eight lots and a single story steel constructed building housing a machine shop and manufacturing plant. The new name of the company will be the A-1 Bit and Tool Company, Limited.

Self-Priming Water Pump

ALLIS-CHALMERS MANUFACTURING COMPANY

Allis-Chalmers Manufacturing Company, Milwaukee, Wisconsin, announces a new type AO self-priming pump, a distinctive feature of which is an improved automatically controlled valve.

Priming is accomplished as the motion of the water throughout the pump runner and the volute passage carries behind it a slug of air, drawing air in the suction passage through the impeller and out through the priming chamber. This hydraulic action lifts the column of water in the suction line and achieves the same results as would a separate vacuum pump. The priming valve closes slowly during this process, acting against a spring tension which governs the rate of priming and the static height of the priming suction lift. The automatic closing of the valve after complete priming prevents water from by-passing back to the suction chamber, with resultant power loss.

Sizes of this pump include two and three-inch at this time. The self-priming device incorporated in these pumps is also adaptable to use with other pumps, particularly the single suction type.

Book on Pipe and Tube Bending

The Copper & Brass Research Association, 420 Lexington Avenue, New York 17, announces the publication of a new and complete treatise showing methods and devices for bending pipes and tubes of copper and its alloys. This book has been prepared at consumers' requests for authoritative information and contains 80 pages of text with 113 figures and illustrations, including 35 full pages of unit weights of tubes of different alloys with varying diameters, wall thicknesses and shapes, as well as pertinent information on the chemical and physical properties of such pipe material. The text covers such subjects as hot and cold bending, medium radii, temper, the use of mandrels of various types, bending with the use of such filler materials as sand, rosin, salt and low melting temperature alloys.

E Pennant Awarded McEvoy Company in Houston

The McEvoy Company, Houston, Texas, has been awarded the Army-Navy "E", as a symbol of highest efforts in production of war equipment. Colonel Merle H. Davis, chief of the St. Louis Ordnance District, presented the award which was accepted by Gus S. Wortham, president of the company. George A. Butler, counsel for McEvoy Company was master of ceremonies. The "E" insignia was presented to employe representatives by Lieutenant Commander James G. Clark, U. S. N. R., expediting officer of the Naval Materials Office.

The company was doubly honored when its chief engineer, Robert Eichenberg, was presented an Ordnance Citation for designing a new space and weight-saving crate for packing machine gun mounts, an accomplishment which Major General L. H. Campbell, Jr., chief of ordnance, praised as a "marked contribution to the vital war production of the United States." Mr. Eichenberg was the first Texan, and the 101st American to receive this citation which was presented by Captain F. P. Calabrese.

The McEvoy Company manufactures oil field products including tubing heads, casing heads, self-operating gas lifts and related products. As a war plant, the company has made a national record manufacturing complicated and extremely close-tolerance machine gun mounts.

McEvoy E presentation. From left to right, George Butler, B. T. McNeil, Lieutenant A. A. Nance, Lieutenant Commander James G. Clark, Gus S. Wortham, Lieutenant Jack Mitchell, Captain George G. McDonald, Major W. R. McCandless, Colonel Merle H. Davis.

Housing for protection of portable transformers

Information supplied by the "Oil Weekly"

Even electrical equipment that is designed for outdoor service may work longer and better if it is given some sort of protection from the weather.

Portable transformers—and their switching equipment—such as are used for drilling power and pump drives are a case in point. In one instance they are mounted inside a light steel house. The house itself is mounted on skids so that it can be easily transferred from one location to another.

Ventilation is an important factor in the operation of such equipment. In this case it is provided by a lowered hood and clearance between the walls and skid numbers. Clearance between the overhang of the roof and the sides serves a double purpose. It permits the flow of natural ventilating currents and at the same time keeps out windborne dust and grit that might otherwise settle on the electrical apparatus to its detriment.

The house has a further advantage. It can be locked up, so that the equipment cannot be tampered with by unauthorized personnel.

CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOLYBDENUM APPLICATIONS.

ARMY E ★ NAVY

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More than ever before you need valves that can "take it."

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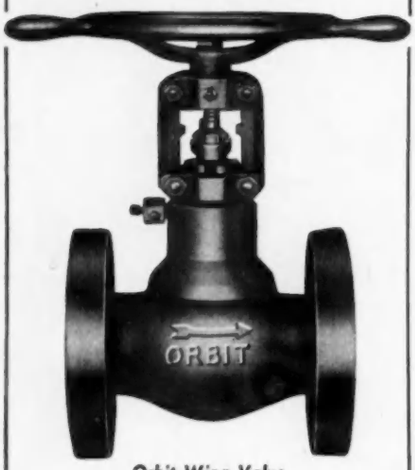

Orbit Wing Valve

ORBIT WING VALVE

This valve is especially designed for Wing Service. Made in 2" size only in both flanged and screwed ends. Opening through valve is 1 1/8". Seats of cast Stellite J Metal.

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YOUR ORBIT VALVES

will last for the duration. Meanwhile, if you have any questions regarding their care or maintenance, write us.

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OIL WELL IMPROVEMENTS CO.

SINCE 1912

TULSA, OKLAHOMA

Men in the Industry's News

FRED H. TOWNSEND, former assistant superintendent of natural gasoline plants of the Lone Star Gas Company and Lone Star Producing Company, has been promoted to superintendent, succeeding Harry Wheeldon, who recently quit to join Shamrock Oil & Gas Corporation at Amarillo. John M. Kindle, West Texas superintendent of gasoline plants, moved to Dallas headquarters as assistant to Townsend, and this vacancy is filled through promotion of Chester R. Rogers with office at Ranger.

FRANK A. TRAVERS of Victoria, Texas, has been designated as agent for the South Basin Oil Company, Los Angeles, California concern that has obtained permit to operate in Texas. The company is capitalized at $1,000,000.

LUCIUS L. HORNE, partner in the Butler & Horne Drilling Company, Dallas producing and drilling firm, has established an office in the Electric Building, Fort Worth, which will be headquarters for his joint operations getting under way in West Texas.

BEN C. BROOCKS, production superintendent for the Sun Oil Company in the Rio Grande district, has been transferred to Corpus Christi as superintendent of Southwest Texas District No. 2, having general supervision over the Beeville, Mirando and Rio Grande districts. He succeeds R. L. Inglish, who has been moved to the Dallas division office as an assistant to John A. Ritter, production department superintendent. B. M. Givens was assigned the Rio Grande district, having previously been superintendent of the Henderson sector of the East Texas field, which will be under the supervision of T. Jerome Sweeney.

H. G. TEXTER will return to Tulsa, Oklahoma, to resume his activities as chief field engineer for Spang-Chalfant, Pittsburgh. Other changes announced by the company are the transfer of James A. Kennedy from Tulsa to Los Angeles, to replace George M. Eaton, who is retiring after many years of representing the company as field engineer in California, and the transfer of N. A. Rebarick to Tulsa. He will succeed Kennedy as field engineer there, after having held various positions in the Operating Department at the company's Seamless Tube Mill, Ambridge, Pennsylvania.

HARRY S. SHEDLOV has opened an office at 30 North La Salle Street, Chicago, as a business counsellor and rationing advisor, specializing in rationing and other problems involving governmental agencies, in the interests of oil companies. Shedlov, was regional Fuel Rationing Officer for the OPA for the seven state Chicago Regional Office, and also has a background of twenty years' experience in the oil industry.

FRANK A. HAVER, 65, independent oil operator of Tulsa, Oklahoma, died at his home, Tuesday, November 9. He had been active in the Osage and Bird Creek fields for many years.

E. F. CLAGETT who has served with The Pure Oil Company and predecessor companies for the past 35 years, died quite suddenly at his home in Saginaw, Michigan, on November 7 from a heart attack. Ed, as he was familiarly known to his many friends both within and without the company, had been manager of Pure Oil's Michigan Producing Division from the inception of that operation in the late twenties. Previously his headquarters had been at the company's Columbus, Ohio, office. Mr. Clagett was 58 years of age.

W. C. BEDNAR, professor of petroleum engineering at University of Oklahoma, has resigned to accept a position of production superintendent for Northern Ordnance, Incorporated, Tulsa.

DR. CLAUDE E. ZoBELL, Scripps Institute of Oceanography, La Jolla, California, spoke to Tulsa Geological Society November 8 on "The Influence of Bacterial Actiivty on Petroleum Deposits and Products."

MILTON M. COOKE, district engineer with the Texas Railroad Commission, Houston, has resigned to join Crown Central Petroleum, Houston. Cooke is a graduate of Texas A. & M. College and has been engaged in the oil industry since 1935.

Advertisers' Index

*Indicates detailed information on products and services included in 1942 edition of Composite Catalog of Oil Field and Pipe-Line Equipment.

Associated Engineers	58
The Baker Hotel	61
Wm. M. Barret, Inc.	58
*Bowen Co. of Texas, Inc.	32
*Brown Oil Tools, Inc.	32
*Buckeye Traction Ditcher Co.	28
*Bucyrus-Erie Co.	29
*Cameron Iron Works, Inc.	II Cover
*Climax Molybdenum Co.	63
Dedman Foundry & Machine Co.	56
Economy Electric Lantern Co.	58
Ft. Worth Laboratories	58
*The Garlock Packing Co.	61
*H. P. Gott Mfg. Co.	60
*The Guiberson Corp.	46
*Haynes Stellite Co.	27
Hill & Hill	58
Houston Laboratories	58
*Hughes Tool Co.	IV Cover
Industrial Engineering Co.	28
The International Nickel Co.	1
*Johns-Manville Corp.	51
*Kerotest Manufacturing Co.	6
*Link-Belt Co.	31
A. M. Lockett & Co., Ltd.	61
*Merco Nordstrom Valve Co.	I Cover
*Mission Manufacturing Co.	34
*Oil City Brass Works	32
*Oil Well Improvements Co.	64
*The Parkersburg Rig & Reel Co.	III Cover
*Patterson-Ballagh Corp.	39
*Pelican Well Tool & Supply Co.	52
Petroleum Electric Power Association	40
*Pittsburgh Equitable Meter Co.	I Cover
*Plymouth Cordage Co.	44
Reading-Pratt & Cady Division American Chain & Cable Co.	49
*Reed Roller Bit Co.	20-21
*Rollway Bearing Co., Inc.	4
Hotel Roosevelt	58
Shell Oil Co.	55
Standard Oil Company of California	33
*Standco Brake Lining Co.	58
*Thornhill-Craver Co.	59
*Union Carbide & Carbon Corp.	27
Visco Products Co., Inc.	3
*Wickwire Spencer Steel Co.	2
York Oilfield Supply Co.	59